

Lesson M1a

EVACUATE! STARTING UP THE PLANT

MATH TEKS OBJECTIVES	
§111.21 – §111.24	7b.1, 8b.1 (A) apply mathematics to problems arising in everyday life, society, and the workplace 6b.1, 7b.1, 8b.1 (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
§111.22	6b.1(C) use integers to represent real-life situations
	6b.2 (A) model addition and subtraction situations involving fractions with objects, pictures, words, and numbers
	6b.2 (B) use addition and subtraction to solve problems involving fractions and decimals
	6b.8 (A) estimate measurements (including circumference) and evaluate reasonableness of results
	6b.8 (B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight
6b.8 (D) convert measures within the same measurement system (customary and metric) based on relationships between units	
§111.23	7b.3(A) apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers
	7b.9(B) determine the circumference and area of circles
§111.24	8b.6(B) model the relationship between the volume of a cylinder and a cone having both congruent bases and heights and connect that relationship to the formulas
	8b.7(A) solve problems involving the volume of cylinders, cones, and spheres
CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupations.

Instructional Directions This activity is designed to take 25 –45 minutes as presented below.

1. This lesson would follow after students are familiar with formulas for surface area of circle and rectangle.
2. Discuss with students the various preparations needed for an evacuation and what needs to be done when we return from the evacuation. What are some of the things we do at home if we had to leave in an emergency situation? What needs to be done when we return? How do they think their parents might need to prepare at work? If some of your students have parents who work in plants, they may be able to share any knowledge they may have with plant turnarounds.
3. Have students complete **Blackline Master M1a.1** and problem solve how they will determine the surface area of this vessel. Guide them through questioning to find that the vessel is a rectangle and two circles. The height of the vessel is one side of the rectangle and the circumference of the circle is the other side.

Learning Outcome(s) Students will be able to use real data to measure, estimate, and hypothesize on real needs and results. Students will determine surface area of a vessel to determine how much cleaning solution is needed to start the plant up again after a shut down and give a cost estimation.

Related Occupations/Industry Specialty Construction Industry; Cost Estimator; Energy Industry: Chemical Plant & System Operator; Petroleum Pump System Operators, Refinery Operators, & Gaugers



Lesson M1a

Deliverables Completed Blackline Master M1a.1 and M1a.2

Resources Needed • Blackline Master M1a.1 and M1a.2

IDEAL

- Integrate actual local business and adapt the lesson to use their actual vessel sizes, metrics, and calculated surface area for the vessels; blue prints or schematics of local plant vessels with all the measurements needed would be useful

LIMITED

- Blackline Master M1a.1 and simple data provided on Blackline Master M1a.2

**Vocabulary or Concepts
(New and/or Challenging)**

- Surface area
- Cost estimation
- Proportions

MODIFICATIONS & EXTENSIONS

- **Story telling:** bring in occupation representatives to provide depth to scenarios (historical actual scenarios related to hurricane or other emergency evacuations and recovery); students may be asked to interview family, industry experts, or other individuals who have been through a similar scenario and can offer suggestions for other similar calculations to be discovered
- Use algebraic reasoning by removing a unit of measure and having students determine the missing unit; have students determine labor costs; convert units; determine volume of vessel
- **Simplify:** Use only whole numbers with rounding if needed



Name _____

Period _____

Date _____

EVACUATE! STARTING UP THE PLANT

The Cynergy plant has just allowed its workers to return after a hurricane evacuation. In order to get the plant running again, it needs to clean out some of the vessels. We need to determine how much cleaning solution will be needed to accomplish this task.



1. What formula(s) will we need to use to find the surface area of this vessel?

2. The solution used to clean this vessel uses 1 gallon per 1000 sq.ft. How will we find out how much of the cleaning solution we will need?

3. What will the cost of the cleaning solution be to clean this vessel/drum (Hint: you will need to research costs to solve this.)

Name _____

Period _____

Date _____

CUSTOMARY UNITS OF MEASURE

This graphic organizer will help you learn about the customary units of measure.

LENGTH

- inch (width of thumb)
- foot (distance from shoulder to elbow)
- yard (width of classroom door)
- mile (total length of 18 football fields)

WEIGHT

- ounce (slice of bread)
- pound (loaf of bread)
- ton (small car)

CAPACITY

- fluid ounce (spoonful)
- cup (glass of juice)
- pint (small bottle of salad dressing)
- quart (small container of paint)
- gallon (large container of milk)

1. Which unit of length is the shortest? _____
2. Which unit of weight is lighter than a ton but heavier than an ounce? _____
3. Which unit of capacity is the greatest? _____
4. Which unit of length is about as long as the distance from your shoulder to your elbow? _____
5. Which unit of capacity is about the capacity of a small bottle of salad dressing? _____
6. Which unit of weight is about the weight of a small car? _____



Lesson M1b

EVACUATE! BLOOD JOURNEY

MATH TEKS OBJECTIVES	
§111.21 – §111.24	7b.1, 8b.1 (A) apply mathematics to problems arising in everyday life, society, and the workplace 7b.1, 8b.1 (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
§111.22	6b.1 (C) use integers to represent real-life situations
	6b.2 (A) model addition and subtraction situations involving fractions with objects, pictures, words, and numbers
	6b.2 (B) use addition and subtraction to solve problems involving fractions and decimals
	6b.3 (B) represent ratios and percents with concrete models, fractions, and decimals
	6b.8 (A) estimate measurements (including circumference) and evaluate reasonableness of results
	6b.8 (B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight
	6b.8 (D) convert measures within the same measurement system (customary and metric) based on relationships between units
§111.23	7b.2 number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers
	7b.3(A) apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers
CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupations.

Instructional Directions

This activity is designed to take 25–45 minutes as presented below.

- Using **Blackline Master M1b**, students will use real data to calculate a resource need based on volume. Have students read the prompt at the top of the page and clarify any information needing additional explanation.
- This lesson should follow an introduction to calculating volume, but may also serve as the introduction if paired with existing resources and lessons.
- The data in this lesson is extracted from The American Red Cross website; however, if a local blood bank has similar related information, the teacher is encouraged to modify the lesson with appropriate data as she/he sees fit.

Reference: <http://www.redcrossblood.org/donating-blood>

Learning Outcome(s)

Students will calculate volume using real data to measure, estimate, or determine resource capacity or need in specific scenarios related to a hurricane evacuation. Specifically, students will measure volume, make inferences, approximate, and hypothesize to determine the amount of blood needed to respond to the emergency scenario following a natural disaster.

Related Occupations/Industry

Health Care: Medical & Clinical Laboratory Technologists; RNs, LVNs, and Doctors
Please consult wrksolutions.com/jobs/focuson.html for more information.



Lesson M1b

Deliverables	Completed Blackline Master M1b
Resources Needed	<ul style="list-style-type: none"> • Blackline Master M1b

IDEAL

- Integrate Blood Bank with a representative visiting classroom (with a mobile blood unit) or field trip to a blood bank
- Have beakers available to measure out the volume of blood needed per person or taken from a blood donor.

LIMITED

- Paper-based

Vocabulary or Concepts (New and/or Challenging)

- Volume
- Pints
- Percent

MODIFICATIONS & EXTENSIONS

- Story telling of a time when blood was needed or donated
- Find factual information on blood donation: How much blood is in the human body? How much blood is donated per year? How much blood is needed in a year? Who needs donated blood? Blood types? Blood screening? Iron?
- Organize and host your own blood drive
- Play a blood game
 - <http://www.redcrossblood.org/donating-blood/donor-zone/games/blood-type>
 - <http://www.redcrossblood.org/donating-blood/donor-zone/games/find-a-word>
- **Simplify:** Keep all numbers whole numbers, rounding if necessary



Name _____

Period _____

Date _____

EVACUATE! BLOOD JOURNEY

The American Red Cross has been called into a local area after a hurricane. There is a real need for blood, so they are sending a mobile blood unit to all the intermediate and high schools in our area to get donations from the community. Each eligible donor (in Texas, age 17 and older) can donate one pint of blood per eight weeks. More than 44,000 blood donations are needed every day. The average red blood cell transfusion requires about 3 pints of blood, however, 1 pint of blood can save up to 3 lives.

1. If our school district is able to collect 123 pints per day, how many pints will we collect in a school week?

2. How many lives could that potentially save?

3. The average adult has 10 pints of blood in his body, what percentage would a person donate per donation?

4. If our school district is able to collect 123 pints per day, what percentage would our district contribute to the need of blood? In a week?

EVACUATE! A TEMPORARY HOME

MATH TEKS OBJECTIVES	
§111.21 - §111.24	<p>7b.1, 8b.1 (A) apply mathematics to problems arising in everyday life, society, and the workplace</p> <p>7b.1, 8b.1 (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution</p> <p>7b.1, 8b.1 (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems</p> <p>7b.1, 8b.1 (D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate</p> <p>7b.1, 8b.1 (E) create and use representations to organize, record, and communicate mathematical ideas</p>
§111.22	<p>6b.1 (C) use integers to represent real-life situations</p> <p>6b.2 (A) model addition and subtraction situations involving fractions with objects, pictures, words, and numbers</p> <p>6b.2 (B) use addition and subtraction to solve problems involving fractions and decimals</p> <p>6b.8 (A) estimate measurements (including circumference) and evaluate reasonableness of results</p> <p>6b.8 (B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight</p> <p>6b.8 (D) convert measures within the same measurement system (customary and metric) based on relationships between units</p>
§111.23	<p>7b.2 Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers</p> <p>7b.3 (A) add, subtract, multiply, and divide rational numbers fluently</p> <p>7b.3 (B) apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers</p>
§111.24	<p>8b.1 (F) analyze mathematical relationships to connect and communicate mathematical ideas</p> <p>8b.1 (G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication</p>
CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	<p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupations.</p>

Instructional Directions

This activity is designed to take 45–75 minutes as presented below.

- By applying the content knowledge to a real-life scenario regarding shelter for a hurricane evacuation, students will complete **Blackline Master M1c**.
- This lesson would be best after students understand how to find the surface area of a rectangle. Showing students the floor plan for the Reliant Center would therefore also be helpful. Use the link on the next page to access the images of the floor plan.
- Because the Reliant Center floor is not rectangular, either have students use a best estimate or you may choose to explain and use calculations for composite figures.
- Have students determine what they think the measurement for a good walking space would be between the cots. Because the walking space is an unknown variable at the beginning of the lesson, this will affect the amount of available space for cots. Similarly, if the space from the composite figures are included, more cots may fit in the space.



5. It is up to the teacher to decide how to implement the dimensions desired in the lesson. The worksheet considers the dimensions of Reliant Center.

6. A sample lesson might consider the floor space as a rectangle. An introductory lesson might only consider a portion of the available space at Reliant Park, such as the football field itself.

Here is an interactive and printable diagram of an NFL football field with dimensions:

<http://tinyurl.com/9olez>

An NFL football field measures 360' (L) x 160' (W) or 57,600 sq. ft.

If a cot is 75" x 26" or 1950 sq. in., each cot takes up (approximately) 13.5 sq. ft.

Therefore, lined end-to-end, 4,265 – 4,267 cots would fit in the available space. However, because this would not allow any room for walking in between the cots, how much space do we allow for a walking path and how many cots can we realistically fit in the space?

Learning Outcome(s) Students will be able to use real data to measure, estimate, and hypothesize on real needs and results. This lesson should follow lessons M1a and M1b, measuring surface area and volume. Students will practice available resource and cost estimation.

Related Occupations/Industry Specialty Construction Industry; Engineer, Cost Estimator, Accountant and Auditor
Please consult wrksolutions.com/jobs/focuson.html for more information.

Deliverables Completed Blackline Master M1c

Resources Needed Blackline Master M1c
Floor plans of the Reliant Stadium, Park and Center can be found at:
<http://reliantpark.com/reliant-stadium>
Blackline Master M1a.2 can be used as a resource for understanding units of measure.

MODIFICATIONS & EXTENSIONS

- Use algebraic reasoning by removing a unit of measure and having students determine the missing unit
- School-to-Home Connection (Lesson M1d)
- **Simplify:** Use only whole numbers with rounding if needed

Name _____

Period _____

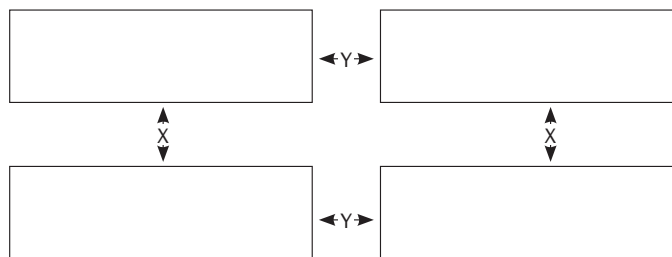
Date _____

EVACUATE! A TEMPORARY HOME

After Hurricane Katrina, many people were displaced because they lost their homes. The Houston community reached out to the victims of this disaster in many ways. One significant contribution the community made was to house the evacuees at the Reliant Center. One challenge was sleeping arrangements.

In an ideal situation, each person would have their own cot. If the floor of the Reliant Center is approximately 706,000 sq. ft. and a cot is 75" L x 26" W x 16" H, how many cots could we fit in this space? Use the box below to sketch the space and write out any necessary calculations.

Now, we need to consider a pathway for the people to walk between cots. Use the diagram below to help you answer the following questions.



1. How much walking space can we allow between cots? _____

2. How much available space for cots does this remove? _____

3. How many cots will we be able to reasonably fit in the remaining available space? _____



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PLANNING AN EVENT

- The following website gives more detail on the various spaces and space configurations available at the Reliant Center. This additional information can be used to extend the lesson by exploring different uses of space based on what the space is to be used for and how the space is to be used.

http://reliantpark.com/sites/reliantpark.com/files/ReliantStadiumSpace_0.pdf

- Have students plan an event of their choice and determine how the space should be utilized complete with drawings of the various items that will take up space at the event. For example, if they are planning a party in the space, they will need to know how much space each table will take, how many people will be able to sit at each table and therefore how many people can be hosted.
- This project should focus on extending the idea of understanding the use of surface area as it accommodates available resources. However, teachers might encourage creativity in the end product through a demonstration of their event in a presentation, poster, or other demonstrable product.



Lesson M1e

EVACUATE! TO EACH THEIR ROLL

MATH TEKS OBJECTIVES	
§111.21 - §111.24	<p>7b.1, 8b.1 (A) apply mathematics to problems arising in everyday life, society, and the workplace</p> <p>7b.1, 8b.1 (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution</p> <p>7b.1, 8b.1 (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems</p> <p>7b.1, 8b.1 (D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate</p> <p>7b.1, 8b.1 (E) create and use representations to organize, record, and communicate mathematical ideas</p>
§111.22	<p>6b.1 (C) use integers to represent real-life situations</p> <p>6b.2 (A) model addition and subtraction situations involving fractions with objects, pictures, words, and numbers</p> <p>6b.2 (B) use addition and subtraction to solve problems involving fractions and decimals</p> <p>6b.8 (A) estimate measurements (including circumference) and evaluate reasonableness of results</p> <p>6b.8 (B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight</p> <p>6b.8 (D) convert measures within the same measurement system (customary and metric) based on relationships between units</p>
§111.23	<p>7b.2 number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers</p> <p>7b.3 (A) add, subtract, multiply, and divide rational numbers fluently</p> <p>7b.3 (B) apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers</p>
§111.24	<p>8b.1 (F) analyze mathematical relationships to connect and communicate mathematical ideas</p> <p>8b.1 (G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication</p>
CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	<p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupations.</p>

Instructional Direction This activity is designed to take 30–60 minutes based on chosen depth of activity.

For this lesson, students need to be able to find surface area of a rectangle and calculate measurement conversions.

1. Pass a roll of toilet paper (or several) around the classroom and ask each student to quickly take as much paper off the roll as they would need for a visit to the restroom.
2. Have students follow the **Blackline Master M1e**. If needed, help students measure with a ruler, being sure they understand how to measure accurately.
3. Review area of a rectangle if needed so students can answer question 4.
4. Question 6 on the worksheet would be an opportunity to set up a proportion to calculate the conversion.



Lesson M1e

5. If possible, have the students take the toilet paper they took from the roll and line the hallway outside the classroom.

Learning Outcome(s)	Students will be able to use real data to measure, estimate, and hypothesize real needs and results. By measuring/calculating surface area and determining how many rolls are needed, they can calculate cost estimations. With this information they can hypothesize the total use and cost of a basic product need during an emergency situation.
Related Occupations/Industry	Specialty Construction Industry; Engineer, Cost Estimator, Accountant and Auditor Please consult wrksolutions.com/jobs/focuson.html for more information.
Deliverables	Completed Blackline Master M1e
Resources Needed	<ul style="list-style-type: none"> • Blackline Master M1e • 2–3 rolls of toilet paper • Ruler
Vocabulary or Concepts (New and/or Challenging)	<ul style="list-style-type: none"> • Square feet • Square inches

MODIFICATIONS & EXTENSIONS

- Students can take the estimated toilet paper used and roll it out to cover a gym floor. This will help them see how much we use and/or waste.
- Integrate actual local business who manufacture paper/toilet paper to explain to the students the manufacturing, cost, and distribution of their product.
- Integrate a waste management professional to come talk to students about what happens after the flush.
- Have family do activity at home. Discuss ways the family can conserve.
- Bring in occupation representatives to provide depth to scenarios (*historical actual scenarios in which resources were critically limited*)
- Measure in one unit (customary) then convert to another (metric); Measure to nearest 1/8" or 1/16"; extend the lesson to multiple times of use per day and/or over a period of days
- **Simplify:** Use only whole numbers with rounding if needed



Name _____

Period _____

Date _____

EVACUATE! TO EACH THEIR ROLL

Instructions:

Quickly take as much toilet paper as you think you might use when you go to the restroom and pass the toilet paper around until everyone has some (careful not to rip it).

- 1.. Count how many individual squares of toilet paper you took and write it here: _____
2. Carefully measure one square of toilet paper to the nearest inch. Be sure to measure all sides and record it below.
3. How many square inches of toilet paper did you use?
4. Assume everyone in the classroom used the same amount of toilet paper you did, how many square inches did the class use?
5. How many square feet is that?
6. Now, assume the 27,000 temporary residents of the Reliant Center from hurricane Katrina used the same amount of toilet paper you did, how many square inches of toilet paper would that be? How many square feet would that be?
7. How many rolls of toilet paper would be needed to cover the floor of the Reliant Center (706,000 ft²) if each roll covered 275 square feet?

30 SECONDS

MATH TEKS OBJECTIVES	
§111.22	6b.1(C) use integers to represent real-life situations 6b.2(B) use addition and subtraction to solve problems involving fractions and decimals 6b.8(A) estimate measurements (including circumference) and evaluate reasonableness of results 6b.8(B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight 6b.10(A) select and use an appropriate representation for presenting and displaying different graphical representations of the same data including line plot, line graph, bar graph, and stem and leaf plot 6b.10(B) identify mean (using concrete objects and pictorial models), median, mode, and range of a set of data 6b.10(D) solve problems by collecting, organizing, displaying, and interpreting data
§111.23	7b.1(A) apply mathematics to problems arising in everyday life, society, and the workplace 7b.3(A) add, subtract, multiply, and divide rational numbers fluently 7b.12(B) use data from a random sample to make inferences about a population
CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	4. The student evaluates skills for personal success. The student is expected to: (B) use interpersonal skills to facilitate effective teamwork; (D) use effective time-management and goal-setting strategies 7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills; (F) complete activities using project- and time-management techniques.
§127.4 c	3. The student explores programs of study. The student is expected to: (C) develop a personal program of study for at least one career. 4. The student explores the professional skills needed for college and career success. The student is expected to: (A) articulate the importance of strong academic skills to meet personal academic and career goals; (B) explore the importance of curricular, extracurricular, career preparation, and extended learning experiences; and (D) explore the steps required to participate in a variety of career and educational opportunities, including, but not limited to, entry-level employment, military service, apprenticeships, community and technical colleges, and universities. 7. The student explores job-seeking skills. The student is expected to: (C) participate in a mock interview.

Instructional Directions **This activity is designed to take 25–90 minutes based on chosen depth of activity.**

1. Decide whether or not you want to give students time to prepare their 30-second commercial, or if you want them to be able to do it without much thought (just like if they were meeting the CEO in the elevator unexpectedly).
2. Instruct students that they will be holding their conversation using the “30-Second Commercial” while their back is to the clock and their partner watches time for them.
3. Once a student thinks they have been talking for 30 seconds, they can ask their partner to stop the clock. The students will then record the actual time on the table.
4. The student recording the time can ask questions of their partner for a true conversation to take place. Partners will then switch roles and record the second time.
5. Once all students are done, have students announce their times for all students to record on table. Be sure students understand how to correctly create a stem and leaf plot as well as calculating central tendencies and range.



Lesson M2

30 SECONDS

Learning Outcome(s) Students will be able to estimate time and use the collected data to appropriately display data in Stem and Leaf Plot as well as find mean, median, mode, and range.

Deliverables Completed Blackline Master M2

Resources Needed

- Blackline Master M2
- Clock/stop watch
- Writing utensil

**Vocabulary or Concepts
(New and/or Challenging)**

- Stem and leaf plot
- Mean
- Median
- Mode
- Range
- Outlier
- Shape of data: symmetrical, skewed, peaks

MODIFICATIONS & EXTENSIONS

- **Simplify:** Use only whole numbers with rounding if needed; use a calculator



Name _____

Period _____

Date _____

30-SECOND COMMERCIAL

What would you say if you were about to interview for a job and you ended up meeting the CEO of the company on the elevator ride up to the office?

People looking for a job are often asked to summarize their experience and interests in a short speech. Sometimes this is called an “elevator speech” or “30-second commercial” because it is the short time recruiters or other hiring managers allow applicants to “sell” themselves before their attention is distracted or disinterest occurs.

Practice your own 30 -second commercial with a partner and make sure you include the following details:

- Information about your education (what you have completed and where you want to go)
- Three unique skills
- At least one notable accomplishment related to the job you might want
- Details on what would make you a good match for this ideal job

Name _____

Period _____

Date _____

30-SECOND COMMERCIAL

How well can people judge the time it takes for 30 seconds to pass?

Instructions: Work with a partner to engage in a conversation about your careers, using your 30-second commercial as material. One partner should watch the clock and the other should speak. Once the speaker thinks 30 seconds have passed, he/she should stop speaking and let the timer know when he/she is done.

The timer should record how much time actually passed here: _____. Switch roles so each has had a turn.

Record data from the entire class:

Student	Actual Time

Student	Actual Time



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Name _____

30-SECOND COMMERCIAL

Record data on the Stem & Leaf chart below.

STEM	LEAF

KEY:

1. **Analyze data:** What is the center of the data: mean, median and mode?
2. **Analyze data:** What is the variability of the data (also known as range)? Identify any outliers.
3. **Analyze data:** Describe the shape of the data using symmetry, skewed and/or number of peaks.
4. **Interpret the results:** Give two descriptive statements that could provide an answer to the question “How well can people judge the time it takes for 30 seconds to pass?”
5. **Analyze the results:** Did you use your 30 seconds as efficiently as possible? If not, what might you add or remove to deliver the best commercial for yourself during this time?



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Lesson M3

PLAN A VACATION

MATH TEKS OBJECTIVES	
§111.22	<p>6b.1 (A) apply mathematics to problems arising in everyday life, society, and the workplace</p> <p>6b.1 (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution</p> <p>6b.1 (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems</p> <p>6b.3 (D) add, subtract, multiply, and divide integers fluently</p> <p>6b.3 (E) multiply and divide positive rational numbers fluently</p> <p>6b.5 (A) represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions</p>

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	<p>5. The student recognizes the impact of career choice on personal lifestyle. The student is expected to: (A) prepare a personal budget reflecting the student's desired lifestyle; (B) use appropriate resources to compare and contrast salaries and educational requirements of at least three careers in the student's interest area *if student is allowed to consider High-Skill, High-Growth Jobs List to make an informed career selection and thus determine a budget based on their chosen career; and (C) evaluate at least three career interests based on budget and salary expectations.</p> <p>6. The student demonstrates an understanding of personal financial management. The student is expected to: (C) simulate different methods of withdrawals and deposits.</p>

Instructional Directions Depending on the parameters chosen by the teacher, this lesson can take 45 minutes – 2 hours and may be a good project-based lesson that can be assigned in part as homework. Or, each worksheet (**Blackline Master M3.1 and M3.3**) can be addressed on separate class days.

There are various ways to implement this lesson. The idea is that it should inspire both informed decision making and creativity while supporting the prevailing concepts of budgeting and consequence.

1. Teachers will distribute **Blackline Master M3.1** and have students read through the project parameters. Their budget must be completed on the accompanying *Vacation Planner* worksheet (**Blackline Master M3.3**). A pencil is recommended for completion to allow for correcting errors in calculation.

2. The teacher may choose to implement as is with the provided approximations for travel expenses, or they can choose to enhance or adapt the lesson with any of the following options (or others of their own choosing):

A. Have student complete the Reality Check activity (found online at texasrealitycheck.com). Have them establish their budget based on one month's salary in their resulting career.

B. Add in luxuries. Students may want to have a "nicer" vehicle that has added perks or they may use a more fuel-efficient vehicle to save money for other items. Either way, they need to research their decision and provide accurate and verifiable data on costs. A rental car website might be a good resource, for example. Sources should be cited.

They may find travel deals for air- or rail-fare that they can incorporate. The budget must still remain the same: \$5,000 or whatever their monthly salary might be (see A. above).



Lesson M3

C. Make it a Family Planning experience. The 7–8 Grade Career Exploration TEKS also include objectives that focus on teamwork and collaboration. Pairing students together as “parents” or into small groups as “families” would allow them to plan a vacation in collaboration while they work on their budgeting and prioritization skills.

Learning Outcome(s)

Students will be able to plan a vacation using a budget. Students will have to estimate expenses (costs), make adjustments based on value judgments, and evaluate outcomes based on goals.

Related Occupations/Industry

Students will be exploring budgeting as it applies to lifestyle decisions and outcomes. The activity also integrates the need to research options prior to decision making. Therefore, the most applicable occupations are: Cost Estimator, Accountant, Financial Analyst, Market Research Analyst and Auditor.

Deliverables Completed Blackline Masters M3.1 and M3.3

Resources Needed • Blackline Masters M3.1, M3.2 and M3.3

IDEAL

- Internet access to maps/research
- Travel Agent/Hospitality SME

LIMITED

- Teacher provides more parameters (such as costs for hotels)
- Ruler
- Map/Atlas

Vocabulary or Concepts (New and/or Challenging)

- Budget
- Miles per gallon
- Miles per hour
- Scale bar (map)
- Scale drawing (map)

MODIFICATIONS & EXTENSIONS

- Go home and talk to parents/guardians about life decisions and circumstance (talking about vacation planning might not always be appropriate based on context)
- Decisions, Decisions game



Name _____

Period _____

Date _____

PLAN A VACATION

You and your family will be taking a seven-day vacation and your parents have told you that you can make all the choices! Where to go? What to see? Where to stay? How long will you be away? What to eat? This is going to be fun!

But, you have to stay within some parameters. First, decide how long your trip will last. For every day that you are on vacation, you must consider the following parameters. This is a driving trip, so you must include the cost of travel by car. You will also need to stay in a hotel. Finally, everyone needs to eat. Complete the questions below. Then review the rules (parameters) for your trip. Plan your vacation in your head then start making decisions for your trip. Fill in the boxes on your Vacation Planner once confirmed. Make sure you stay in budget!

So, where would you like to go? _____

How far is your destination? _____ miles

How many people are on your trip? _____ age 10+ _____ age 0–9 yrs

Your trip must include all the following:

- Budget:** \$5,000
- Transportation:** use your ruler and map/atlas to determine where you will travel, cost of gas, time it will take to travel.
Try not to drive more than 400 miles a day. This may require you to stop and stay overnight somewhere on the way.
Fuel \$3.49 per gallon
Car gets 18 miles per gallon
Car drives 70 miles per hour (on average)
- Lodging:** (based on 4-person occupancy, \$10 for additional occupant; maximum of 5 occupants per room per day)
\$69 for 2 double beds
\$99 for 2 double beds, sofa, and continental breakfast
\$149 for 2 queen beds, sofa, and continental breakfast
- Meals:** each family member is required to have at least 2 meals per day (one of those meals must be dinner).
\$5 Breakfast per person
\$7 Lunch per person
\$15 Dinner per person
- Entertainment:** what activities will you do on your visit?



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Budget Example

VACATION PLANNER

How many people on vacation? 4

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	TOTALS	
starting in Houston, TX	drive to Gulfport, MS	drive to Orlando, FL				drive to New Orleans, LA	drive to Houston, TX		
Transportation									
Distance	402 miles	433 miles				640 miles	350 miles	1825	miles traveled
Travel Time (miles/70 mph)	5.74 hours	6.19 hours				9.14 hours	5 hours	26.07	hours on the road
Cost (miles/18 mpg x \$3.49)	\$77.94	\$83.95				\$124.09	\$67.86	\$353.84	travel costs
Lodging									
Days Inn: 2 double beds + breakfast	\$99.00							\$99.00	lodging costs
Sports Resort @ Disney: 2 qn beds + brk		\$149.00	\$149.00	\$149.00	\$149.00			\$596.00	
Hilton Riverside: 2 qn beds + brk						\$149.00		\$149.00	
Meals (meals total x 4)	\$80.00	\$88.00	\$88.00	\$88.00	\$88.00	\$88.00	\$80.00	\$600.00	meal costs
	lunch + dinner	breakfast, lunch + dinner	breakfast, lunch + dinner	breakfast, lunch + dinner	breakfast, lunch + dinner	breakfast, lunch + dinner	breakfast + lunch		
Entertainment									
Admission Tickets for Four Days (\$279 per ticket)		\$1,116.00						\$1,116.00	entertainment
Souvenirs for the Kids (\$25 each)			\$50.00	\$50.00	\$50.00			\$150.00	
Tickets for a Riverbarge Cruise (\$32 x 4)						\$128.00		\$128.00	
							TOTAL EXPENSES	\$3,191.84	



Name _____

Period _____

Date _____

VACATION PLANNER

How many people on vacation? __

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	TOTALS
starting in								
Transportation								
Distance								miles traveled
Travel Time (miles/70 mph)								hours on the road
Cost (miles/18 mpg x \$3.49)								travel costs
Lodging								
								lodging costs
Meals (meals total x 4)								meal costs
	lunch + dinner	breakfast, lunch + dinner	breakfast, lunch + dinner	breakfast, lunch + dinner	breakfast, lunch + dinner	breakfast, lunch + dinner	breakfast + lunch	
Entertainment								
								entertainment
							TOTAL EXPENSES	



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Lesson M4

MINIATURE GULF COAST PROJECT

MATH TEKS OBJECTIVES	
§111.22	<p>6b.1 (A) apply mathematics to problems arising in everyday life, society, and the workplace;</p> <p>6b.1 (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;</p> <p>6b.1 (D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate; 6b.1E create and use representations to organize, record, and communicate mathematical ideas;</p> <p>6b.1 (F) analyze mathematical relationships to connect and communicate mathematical ideas;</p> <p>6b.1 (G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication;</p> <p>6b.5 (A) represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions;</p> <p>6b.12 (A) represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots;</p> <p>6b.12 (B) use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution;</p> <p>6b.12 (C) summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution;</p> <p>6b.12. (D) summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution;</p> <p>6b.13. (A) interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots;</p> <p>6b.13. (B) distinguish between situations that yield data with and without variability.</p>

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.4 c	<p>6. The student explores labor market information. The student is expected to: (A) analyze national, state, regional, and local labor market information; (B) cite evidence of high-skill, high-wage, or high-demand occupations based on analysis of labor market information; and (C) analyze the effects of changing employment trends, societal needs, and economic conditions on career planning.</p>

Instructional Directions This activity is designed to take **60–90 minutes of instructional time and 6–8 hours of project time based on chosen depth of activity. The lesson components should be separated and delivered as best suited for your instructional needs.**

This lesson can be delivered in two ways:

1. Show the video “Miniature Earth” found on You Tube at <http://tinyurl.com/yvurqu>. Then, have students review **Blackline Master M4.2** "Miniature Gulf Coast" Scaled Data. Ask students to write down three careers they see as critical to future societal needs before and after the video. Lead a short discussion about their initial thoughts and thoughts after viewing the video. Add additional questions of your own to enhance the discussion as time permits. This lesson can then be used to introduce other lessons that focus on high-skill, high-growth jobs for our region or initial research into one of these careers.
2. A more in-depth variation on this lesson can be done over a series of class periods where students would have time to view the video, create a data collection and analysis research project, and make informed conclusions about their research. Access to a computer with internet access is ideal.

By scaling the statistics, the numbers should have more meaning to the students than data that is based on national or global data. Have students compare the numbers used in the video and relate the same numbers to their everyday life (if you are on a campus of about 1000 students this would be a good connection).



Lesson M4

- Instructional Directions**
- Go over rubric with students and clarify any questions. Consider also providing students a timeline for due dates and class work days on the project.
 - Students will choose a research question in one of the following “world issue” areas:
 - (Un-)Employment
 - Educational Attainment
 - Income
 - Transportation & Commuting
 - Cost of Living
 - Accessibility to Resources
 - Distribution/Availability of Career
 - Technology
 - Health & Mortality
 - Hand students the Miniature Gulf Coast Project Plan (**Blackline Master M4.1**). Discuss pros and cons of working as an individual or as a partner group. Have student choose an area they would like to investigate. Once they have done this, discuss how to develop an effect quantitative question for research.

For example: If a student chooses Transportation & Commuting, a good effective quantitative question could be “How many cars do you know of that your family has owned?”. All responses need to be a single numerical response and a question that their peers can answer readily when surveyed. Questions should not be “double-barrelled” (i.e. How many dogs and cats do you have?), where two numbers would be required to answer the question.
 - Hand students Final Project Plan sheet as their final approved question for research. Once teacher has these questions, create surveys either on paper or in a tool such as Google Docs or Survey Monkey. It is best to survey 50–100 peers for an appropriate sample size. Set aside adequate time for students to respond to all the survey questions. Depending on the sample size, this may take up to one or two class periods. Discuss with students about answering the questions to the best of their ability. Once the surveys are complete, give each student their raw data (responses to survey).
 - Students should then compile mean, median, and mode for the data and should graph their data as is appropriate. Graphing tools in Excel or other software might be used depending on how technologically-driven you want the exercise to be. The data should be summarized in either a final paper or project relating their data analysis to a conclusion or conclusions about their world issue.

Learning Outcome(s) Students will be able to relate the community at large in proportion to their immediate community within their classrooms. They will practice creating and analyzing ratios and proportions as well as functions of quantitative (raw) data. Graphed data may be an outcome of the project.

Deliverables Formal essay or project board detailing research question, method, data collection, and conclusions.

Resources Needed

IDEAL

- Computer
- Internet
- Excel
- PowerPoint
- Google Docs/Survey Monkey

LIMITED

- This project is possible without internet or technology access but may need to be scaled down to a smaller sample size to make implementation easier. Paper-based data collection, distribution, and analysis would be the immediate adaptation.

Vocabulary or Concepts (New and/or Challenging)

- Mean
- Median
- Mode
- Ratio
- Proportion
- Graph
- Data
- Raw Data
- Research Question
- Sample



Name _____

Period _____

Date _____

GULF COAST COMMUNITY PROJECT PLAN

THE PLAN

Area of interest (check one):

- | | |
|---|---|
| <input type="checkbox"/> Employment/Unemployment | <input type="checkbox"/> Accessibility to Resources |
| <input type="checkbox"/> Educational Attainment | <input type="checkbox"/> Distribution/Availability of Careers |
| <input type="checkbox"/> Income | <input type="checkbox"/> Technology |
| <input type="checkbox"/> Transportation & Commuting | <input type="checkbox"/> Health & Mortality |
| <input type="checkbox"/> Cost of Living | |

I WANT TO WORK (choose one)

- Alone
- With a partner. My partner will be: _____

Phone #: cell _____ home _____

e-mail _____

PROBLEM (state your research question)

METHOD

Descriptive/Survey – This method will be used by all students for this project.



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Name _____

Period _____

Date _____

GULF COAST COMMUNITY PROJECT PLAN

(Every student required to turn in a partner plan)

RESEARCH QUESTION

(Must be an effective question one of your classmates can answer and is quantifiable; no number ranges, only individual number responses): _____

PLEASE READ AND CHECK THE APPROPRIATE BOXES.

I am aware of this major grade and the due dates.

My child is choosing to do this project alone.

- OR -

My child is choosing to do this project with a partner.

Partner's name _____

Partner's home and cell numbers _____

Partner's e-mail address _____

I understand that my child will be given 12 class days to complete this project (ample time if student(s) stays on task).

Students are welcome to come work on their project during tutorials. If the project is not completed in class, they will have to complete it on their own outside of school.

Parent Signature _____ (5 point Bonus)

_____ Teacher initials and date if final plan approved - OR -

_____ My plan needs to be revised and turned back into the teacher by _____ in order for me to receive a grade for this assignment.

REVISED QUESTION:



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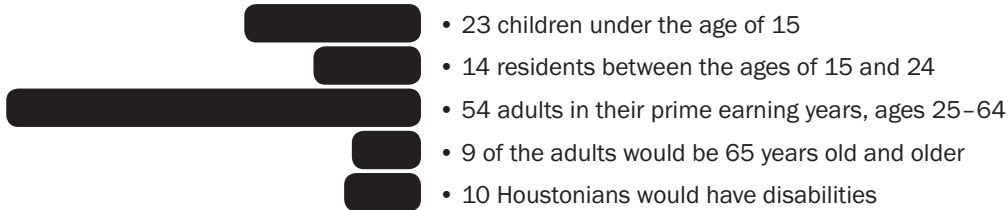
IF HOUSTON WERE A VILLAGE OF 100 PEOPLE...

The U.S. Census Bureau estimates that metro Houston had 6,177,035 residents on July 1, 2012. Based on recent trends, the region's population probably exceeds 6.3 million today. That's a hard number for some to fathom, especially when one considers all the demographic, social and economic characteristics of 6.3 million people. But if Houston were a village of 100 people, that might be easier to grasp. Based on recently released census data, if Houston were a village of 100 people this is how our hamlet would look:

GENDER



AGE AND DISABILITY



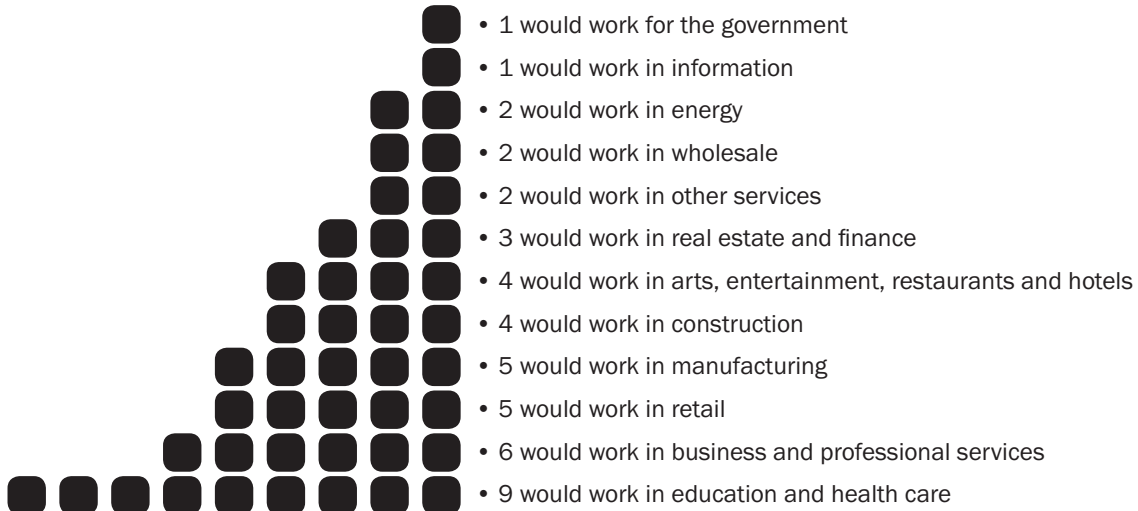
EMPLOYMENT

(among the residents over the age of 16)




OCCUPATIONS

(among the employed residents)




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LANGUAGE

- 
- 62 Houstonians would speak only English at home
 - 38 would speak a language other than English

BIRTHPLACE


- 
- 78 would have been born in the U.S.
 - 22 would have been born overseas
 - 1 would have been born in Europe
 - 1 would have been born in Africa
 - 4 would have been born in Asia
 - 16 would have been born in Latin America
 - 14 of the 22 villagers would not be U.S. citizens

ETHNICITY


- 
- 7 Asians
 - 17 Blacks
 - 36 Hispanics
 - 39 Anglos
 - 1 person of mixed race

EDUCATION

(among the 63 adults)

- 
- 6 would have less than a ninth grade education
 - 6 would have not completed high school
 - 15 would have a high school diploma
 - 18 would have some college or an associate's degree
 - 12 would have graduated college
 - 6 would have a graduate degree

TRANSPORTATION

- 
- 38 would drive alone to work every day
 - 5 would carpool
 - 1 would take public transportation
 - 1 would travel by other means
 - 3 would work at home

HEALTH CARE

- 
- 77 would have health insurance coverage
 - 23 would be uninsured

The village numbers are derived from the Census Bureau's 2012 American Community Survey. When calculating the village, the residents were rounded to the nearest whole number.



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Lesson S1a

ON THE JOB: PROVE THE PROFESSION (Group & Justify Activity)

SCIENCE TEKS OBJECTIVES	
§112.18	6.2, 7.2, 8.2 (E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends. 6.3, 7.3, 8.3 Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions. The student is expected to: (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student.

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	4. The student evaluates skills for personal success. The student is expected to: (C) use a problem-solving model and critical-thinking skills to make informed decisions; and (F) identify skills that can be transferable among a variety of careers. 8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.
§127.4 c	1. The student explores one or more career clusters of interest. The student is expected to: (A) identify the various career opportunities within one or more career clusters;

Instructional Directions This activity is designed to take 15 – 25 minutes as presented below.

1. The teacher should distribute the cards, **Blackline Master S1a.1**, to students individually or in groups.
2. Students review pictures of people working and find common characteristics to formulate relationships.
3. Arrange pictures into groups based on the identified relationships.
4. Students must justify to others (peers and/or instructor) the groups made.
5. The teacher may elect to use **Blackline Master S1a.2** to collect responses.

Learning Outcome(s) The students will be able to justify his/her decisions based on observations, inferences and schema. There are no “right or wrong” answers if quality justification can be made.

Related Industries/Occupations Teacher, Postsecondary Teacher, Counselor, Pharmacist, Welder, Electrician, Network & Computer Systems Administrator, Engineer, Industrial Machinery Mechanic, Machinist, Service Unit Operator, Geoscientist, Registered Nurse, Licensed Vocational Nurse, Radiologic Technologist, Physical Therapist, Computer Systems Analyst, Systems Software Developer, Plumber and Paralegal.

Deliverables Peer review or teacher review of groupings. Oral justifications of groupings.

Resources Needed **Blackline Master S1a.1**
Note: While this is designed to achieve Science TEKS objectives, this activity could be completed in any subject matter classroom in the intermediate school level.

- Vocabulary or Concepts (New and/or Challenging)**
- Relationships
 - Attributes
 - Classification
 - Rationalize/rationalization
 - Justify/justification



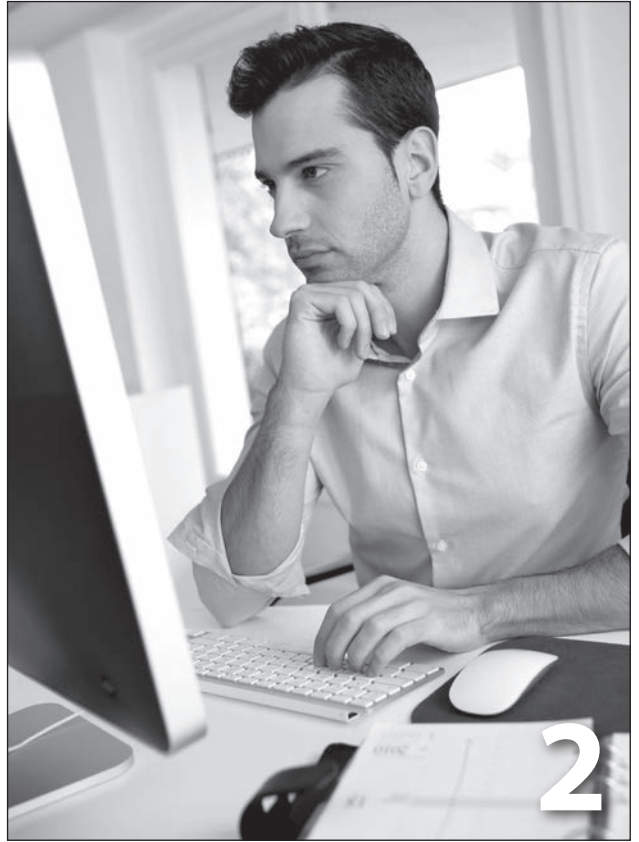
Lesson S1a

ON THE JOB: PROVE THE PROFESSION (Group & Justify Activity)

MODIFICATIONS & EXTENSIONS

- As time allows, a variation on this activity would allow students to make as many groupings as possible within an allotted amount of time (no more than five minutes is recommended). Students would then compare groups and would cross off any groups that are similar to those discovered by other students. The student/group with the most unique groupings “wins.”
- Have students take or collect pictures of professions in action, including people, tools, products, and services from each profession. Have them present as a poster board or online project board presentation of their classifications.
- After student observes pictures, conduct a teacher-led discussion to find common features seen in pictures.
- Give students group names for career clusters and have them put pictures in the given categories.
- Students can put pictures into sub-groups within the categories that they have made.
- Students can hypothesize careers/ industries represented – with answers on the back of pictures.
- Students can hypothesize careers/ industries represented – with no answers on the back of pictures.
- Students can hypothesize/discuss/ research the type of education required for this profession.
- Students can reference Focus On profiles (wrksolutions.com/jobs/focuson.html) or High-Skill, High-Growth Jobs List (wrksolutions.com/jobs/doc/WFS-HSHG.pdf) to initiate research.





COMPUTER SYSTEMS ANALYSTS

Computer systems analysts solve computer problems and apply computer technology to meet the needs of an organization. They analyze user requirements, procedures, and problems to automate or improve existing systems, and review computer systems capabilities, workflow, and scheduling limitations.

Median Hourly Wage:	\$40.12
Jobs in 2010:	11,020
Estimated Jobs in 2020:	13,520
Employment Growth:	22.7%
Annual Average Job Openings:	455
Minimum Education:	Bachelor's degree

2

PRIMARY, SECONDARY, & SPECIAL EDUCATION SCHOOL TEACHERS

Teachers who work in the public school education system teach grades kindergarten through 12. Some teachers can work in private or charter schools, which may serve special needs or gifted children.

SUBSET: BILINGUAL EDUCATION, SPECIAL EDUCATION, SECONDARY SCIENCE AND MATH TEACHER

Median Hourly Wage:	N/A
Jobs in 2010:	103,760
Estimated Jobs in 2020:	152,220
Employment Growth:	46.7%
Annual Average Job Openings:	7,365
Minimum Education:	Bachelor's degree

1

PHARMACISTS

Pharmacists count pills, fill prescriptions and provide proper selection and dosage of medications, interactions, and side effects of medications.

Median Hourly Wage:	\$53.15
Jobs in 2010:	5,130
Estimated Jobs in 2020:	6,560
Employment Growth:	27.9%
Annual Average Job Openings:	275
Minimum Education:	Master's degree & license

4

INDUSTRIAL MACHINERY MECHANICS

Industrial mechanics perform a wide variety of duties, such as preventive maintenance, detecting breakdown conditions before they happen, making machinery adjustments, and repairing equipment using blueprints, sketches, diagrams, and a variety of tools.

Median Hourly Wage:	\$23.23
Jobs in 2010:	11,630
Estimated Jobs in 2020:	16,460
Employment Growth:	41.5%
Annual Average Job Openings:	710
Minimum Education:	Long-term on-the-job training

3



ELECTRICIANS

Electricians are in short supply and demand continues to grow in response to an ever-increasing population and as a growing number of baby boomers retire. The shortage of electricians translates into outstanding career opportunities to individuals entering into the workforce.

Median Hourly Wage:	\$21.43
Jobs in 2010:	14,030
Estimated Jobs in 2020:	16,790
Employment Growth:	19.7%
Annual Average Job Openings:	655
Minimum Education:	Long-term on-the-job training

6

REGISTERED NURSES

A registered nurse (RN) is a nurse who has graduated from a nursing program at a university or college and has passed a national licensing exam. A registered nurse helps individuals, families, and groups to achieve health and prevent disease.

Median Hourly Wage:	\$34.43
Jobs in 2010:	43,870
Estimated Jobs in 2020:	60,620
Employment Growth:	38.2%
Annual Average Job Openings:	2,470
Minimum Education:	Bachelor's degree preferred

5

SOFTWARE DEVELOPERS, SYSTEMS SOFTWARE

Software developers, systems software, coordinate the construction, maintenance, and expansion of an organization's computer system.

Median Hourly Wage:	\$42.93
Jobs in 2010:	8,220
Estimated Jobs in 2020:	10,770
Employment Growth:	31.0%
Annual Average Job Openings:	340
Minimum Education:	Bachelor's degree

8

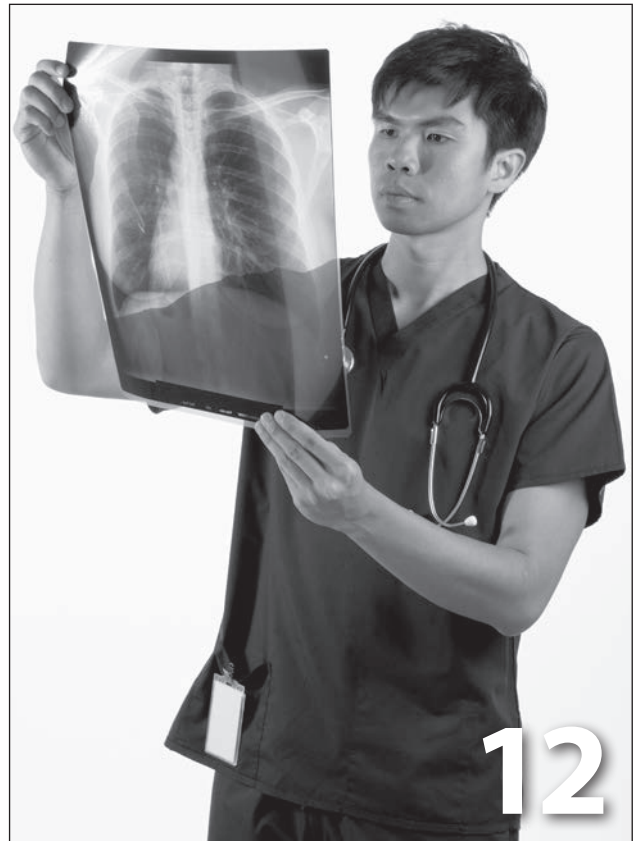
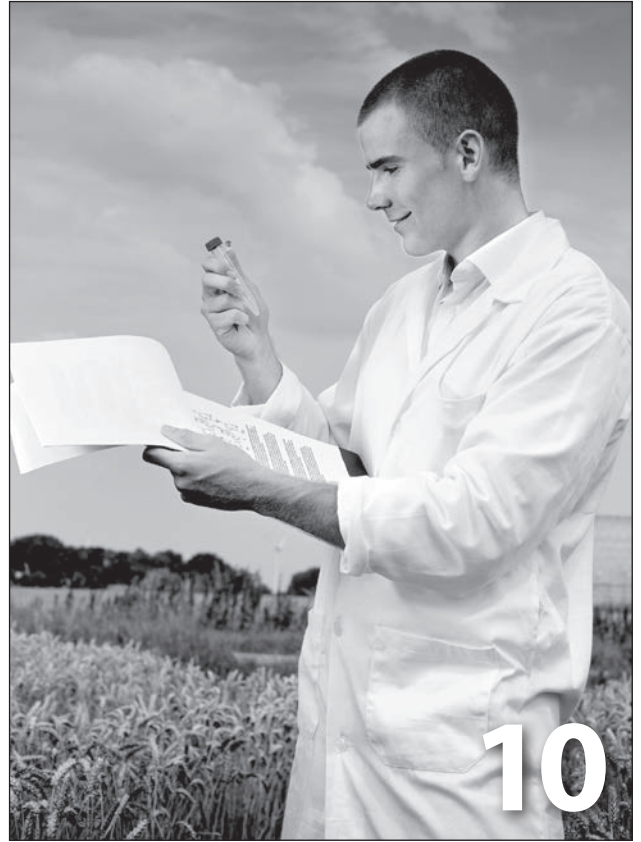
ENGINEERS

Engineers design, develop, test, or supervise manufacturing projects and work in the chemical, civil, computer hardware, electrical, electronic, industrial, mechanical, petroleum, and other industries.

SUBSET: ENVIRONMENTAL ENGINEER, PETROLEUM ENGINEERS, MINING AND GEOLOGICAL ENGINEERS

Median Hourly Wage:	N/A
Jobs in 2010:	47,870
Estimated Jobs in 2020:	58,880
Employment Growth:	23.0%
Annual Average Job Openings:	2,245
Minimum Education:	Bachelor's degree

7



GEOSCIENTISTS, EX. HYDROLOGISTS & GEOGRAPHERS

Geoscientists study the composition, structure, and other physical aspects of the earth for the purpose of oil and gas exploration. Some find additional opportunities in education, mining, government, and the environmental industry.

Median Hourly Wage:	\$61.63
Jobs in 2010:	4,670
Estimated Jobs in 2020:	6,370
Employment Growth:	36.4%
Annual Average Job Openings:	310
Minimum Education:	Bachelor's degree

10

WELDERS, CUTTERS, SOLDERERS, & BRAZERS

Welders, cutters, solderers, and brazers can use their skills to pursue careers in high-demand occupations such as: welder-pipefitter and other pipe trades, structural welder, welder-fitter, maintenance mechanics, scaffold builders, and millwrights.

Median Hourly Wage:	\$17.93
Jobs in 2010:	15,510
Estimated Jobs in 2020:	19,650
Employment Growth:	26.7%
Annual Average Job Openings:	830
Minimum Education:	Postsecondary vocational training

9

RADIOLOGIC TECHNOLOGISTS & TECHNICIANS

Radiologic technologists perform imaging tests to assist in diagnosing patients. Some radiologic technologists specialize in computerized tomography (CT) and magnetic resonance imaging (MRI).

Median Hourly Wage:	\$26.27
Jobs in 2010:	3,760
Estimated Jobs in 2020:	5,300
Employment Growth:	41.0%
Annual Average Job Openings:	215
Minimum Education:	Associate's degree

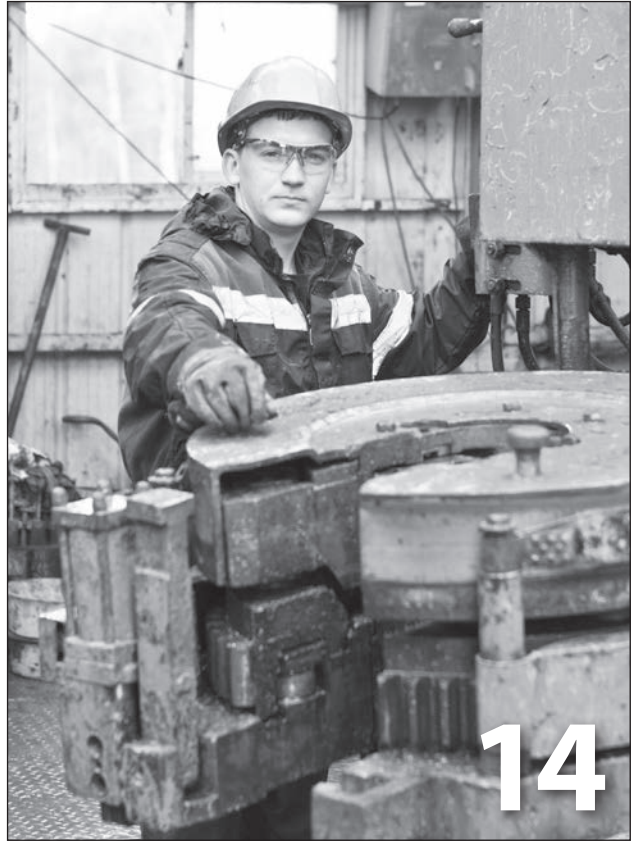
12

MACHINISTS

Machinists are highly-skilled manufacturing workers. They use power-operated tools to produce precision metal or plastic parts.

Median Hourly Wage:	\$18.95
Jobs in 2010:	11,850
Estimated Jobs in 2020:	14,850
Employment Growth:	25.3%
Annual Average Job Openings:	520
Minimum Education:	Long-term on-the-job training

11



SERVICE UNIT OPERATORS, OIL, GAS, & MINING

A service unit operator's responsibility is to maintain or increase oil/gas flow from producing wells.

Median Hourly Wage:	\$18.58
Jobs in 2010:	6,570
Estimated Jobs in 2020:	8,930
Employment Growth:	35.9%
Annual Average Job Openings:	375
Minimum Education:	Moderate-term on-the-job training

14

LICENSED PRACTICAL & LICENSED VOCATIONAL NURSES

Licensed vocational nurses (LVNs), referred to as licensed practical nurses in some other states, care for the sick, injured, convalescent, and disabled under the direction of physicians and registered nurses.

Median Hourly Wage:	\$21.28
Jobs in 2010:	14,600
Estimated Jobs in 2020:	18,920
Employment Growth:	29.6%
Annual Average Job Openings:	820
Minimum Education:	Postsecondary vocational training

13

PLUMBERS, PIPEFITTERS, & STEAMFITTERS

Plumbers, pipefitters, and steamfitters are among the largest and highest-paid construction occupations. Plumbers, pipefitters, and steamfitters install, maintain, and repair many different types of pipe systems that carry water, steam, air, or other liquids or gases.

Median Hourly Wage:	\$23.60
Jobs in 2010:	10,420
Estimated Jobs in 2020:	12,610
Employment Growth:	21.0%
Annual Average Job Openings:	520
Minimum Education:	Long-term on-the-job training

16

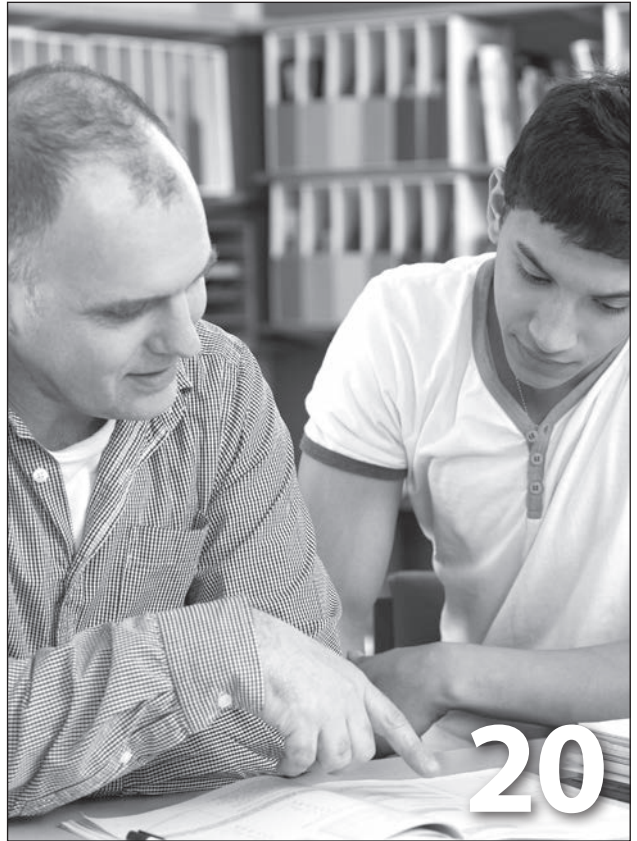
POSTSECONDARY TEACHERS

Postsecondary teachers instruct students in a wide range of subjects after high school. In addition, many do research in their area of specialization.

SUBSET: NURSING INSTRUCTORS AND TEACHERS, POSTSECONDARY

Median Hourly Wage:	N/A
Jobs in 2010:	30,410
Estimated Jobs in 2020:	37,350
Employment Growth:	22.8%
Annual Average Job Openings:	1,180
Minimum Education:	Master's/Doctoral degree

15



PHYSICAL THERAPISTS

Physical therapy is the method of treatment that varies case by case and can be anything from therapeutic exercise and functional training to the use of adaptive devices and equipment or even various forms of electrotherapy.

Median Hourly Wage:	\$39.38
Jobs in 2010:	2,960
Estimated Jobs in 2020:	4,030
Employment Growth:	36.1%
Annual Average Job Openings:	140
Minimum Education:	Bachelor's degree & license

18

PARALEGALS & LEGAL ASSISTANTS

Paralegals, also referred to as legal assistants, assist lawyers by researching legal precedent, investigating facts, or preparing legal documents.

Median Hourly Wage:	\$23.86
Jobs in 2010:	4,730
Estimated Jobs in 2020:	6,280
Employment Growth:	32.8%
Annual Average Job Openings:	220
Minimum Education:	Associate's degree

17

EDUCATIONAL, VOCATIONAL, & SCHOOL COUNSELORS

Counselors cover a wide scope of activities for students ranging from encouragement of academics, career and personal/social development, to helping students maximize their academic achievements.

Median Hourly Wage:	\$27.93
Jobs in 2010:	6,250
Estimated Jobs in 2020:	8,540
Employment Growth:	36.6%
Annual Average Job Openings:	365
Minimum Education:	Bachelor's degree

20

NETWORK & COMPUTER SYSTEMS ADMINISTRATORS

Network and computer systems administrators are professionals that analyze, design and test local area networks (LAN), wide area networks (WAN), Internet, intranet, and other data communications systems.

Median Hourly Wage:	\$34.43
Jobs in 2010:	6,720
Estimated Jobs in 2020:	8,910
Employment Growth:	32.6%
Annual Average Job Openings:	335
Minimum Education:	Bachelor's degree

19

Name _____

Period _____

Date _____

ON THE JOB: PROVE THE PROFESSION

(Group & Justify Activity)

Review the pictures of people working and find common characteristics to formulate relationships. Arrange pictures into groups based on the identified relationships. You must justify your decisions based on observations, inferences and schema. There are no “right or wrong” answers if quality justification can be made. Make any notes below that may help you justify or prove your answers.

Name of group	Cards in group	Reason for grouping
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Lesson S1b

ON THE JOB: SOUNDS OF THE WORK WORLD (Name that Sound)

SCIENCE TEKS OBJECTIVES	
§112.18	<p>6.2, 7.2, 8.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:</p> <p>(B) design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;</p> <p>(C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;</p> <p>6.3, 7.3, 8.3 Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem-solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to: (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student.</p>

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	<p>2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (D) determine the impact of technology on careers of personal interest.</p> <p>4. The student evaluates skills for personal success. The student is expected to: (C) use a problem-solving model and critical-thinking skills to make informed decisions.</p> <p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupations.</p>

Instructional Directions This activity is designed to take 30–45 minutes as presented below.

1. Set up sounds with appropriate volume for each student to hear sound clips of the 10 Workforce Solutions high-skill, high-growth jobs provided. (this could be one source to listen to as a class or an individual device that students could listen to with earphones).
2. Provide chart for students to first record the hypothesis of the sounds they hear from the recording. Guiding questions: What do you think makes this sound? What type of job might have this sound in its environment? Encourage students to record observations that inform their research in the notes box on their worksheets.
3. Give students copies of the Workforce Solutions High-Skill, High-Growth Jobs List and have the students hypothesize what job is associated with each sound. Play sounds again at your discretion.
4. Reviewing answers as a group or class will give students an opportunity to justify their thoughts. Students could compare answers with a partner before the classwide discussion.

Learning Outcome(s) The students will use observation skills to record hypotheses of sounds heard and then hypothesize about the type of job where that sound may be heard. Students will understand that observations are not just by sight.

Related Industries/Occupations These 10 jobs have been selected:

- Plumber (flushing toilet)
- Mobile Heavy Equipment Mechanic/Operator (large machine/truck moving)
- Geoscientist (rocks being manipulated/crushed)
- Electrical Power Line Installer/Repairer (buzzing electrical lines)
- Registered Nurse (heart monitor)
- Dentist (tooth drilling)



ON THE JOB: SOUNDS OF THE WORK WORLD

(Name that Sound)

- Pharmacist (pills being manipulated)
- Radiologic Technologist (x-ray or MRI machine)
- Respiratory Therapist (breathing)
- Accountant (calculations on a keyboard/calculator)

Deliverables Completed Blackline Master S1b

- Resources Needed**
- Sound clips of the jobs listed above:
wrksolutions.com/whenigrowup/ms/sounds/sounds.zip
 - Device to project sound
 - Blackline Master S1b
 - Workforce Solutions High-Skill, High-Growth Jobs List

Vocabulary or Concepts
(New and/or Challenging)

- Observations
- Quantitative observations
- Qualitative observations
- Auditory

MODIFICATIONS & EXTENSIONS

- Students hypothesize smells that could be associated with each job above or others.
- Students hypothesize on sounds aloud. Pictures of each job could be associated with each job. Match the sound to the picture. (see Blackline Masters for lessons S1a and S1d)
- Students make recordings of their own world to share and have others hypothesize.
- **Simplify:** Students are given a list of the sounds and they choose which sound they hear after listening to each clip.
- **Simplify:** Students hypothesize the sounds but are given a list of jobs associated with the sounds and they match the sound to the job.



Name _____

Period _____

Date _____

ON THE JOB: SOUNDS OF THE WORK WORLD

(Name that Sound)

Hypothesize about the sounds you observe as you listen to audio clips from the world of our region's workplaces. Then look at the High-Skill, High-Growth Jobs List and hypothesize the job that could be associated with that sound. Make any notes that may help you justify or prove your answers.

Description of sound	Jobs that might create that sound	Notes
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

List of jobs that could create the sounds you have heard:

- Plumber
- Mobile Heavy Equipment Mechanic/Operator
- Geologist
- Electrical Power Line Installer/Repairer
- Registered Nurse
- Dentist
- Pharmacist
- Radiologic Technologist
- Respiratory Therapist
- Accountant

Lesson S1c

ON THE JOB: PROFESSION PHOTO PUZZLE HUNT (Identify the Differences)

SCIENCE TEKS OBJECTIVES

§112.18	<p>6.2, 7.2, 8.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to: Plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;</p> <p>Design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;</p> <p>Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.</p> <p>6.3, 7.3, 8.3 Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem-solving to make informed decisions and knows the contributions of relevant scientists.</p> <p>The student is expected to: (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student.</p>
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CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES

§127.3 c	<p>4. The student evaluates skills for personal success. The student is expected to: (C) use a problem-solving model and critical-thinking skills to make informed decisions.</p> <p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupation.</p>
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Instructional Directions

This activity is designed to take 5– 50 minutes based on chosen content, modifications or extensions

Each picture has two “versions.” By using keen observations skills, students can find as many differences between the pictures as possible. Differences can be recorded on **Blackline Master S1c**.

Learning Outcome(s)

Students will use acute visual discrepancy skills to analyze the differences between two versions of the same photograph depicting Workforce Solutions high-skill, high-growth jobs.

Related Industries/Occupations

Specialty Construction Industry

Deliverables

Completed Worksheet with differences between each picture listed.

Resources Needed

- Blackline Master S1c
- IDEAL: An additional digital photograph for the extension activity.

Vocabulary or Concepts (New and/or Challenging)

- observe
- observation skills
- visual acuity
- minute (as in small)
- analyze/analysis

MODIFICATIONS & EXTENSIONS

- Students with access to computer programs for altering photos could change a photograph then share for other students to observe and analyze. Consider having students add original & modified photos to a teacher-monitored photo-sharing Internet site (such as Flickr or Photobucket) or a social media app (such as Instagram)
- **Simplify:** This lesson could be done orally without any writing at all – answers could be discussed orally. Project image for the class to view as a whole or pass out into small groups. It could be used as a warm up to get students focused. This could also be used during short class period schedules when a “scientific” activity is needed but there is not adequate time for a lab or full lesson.



Name _____

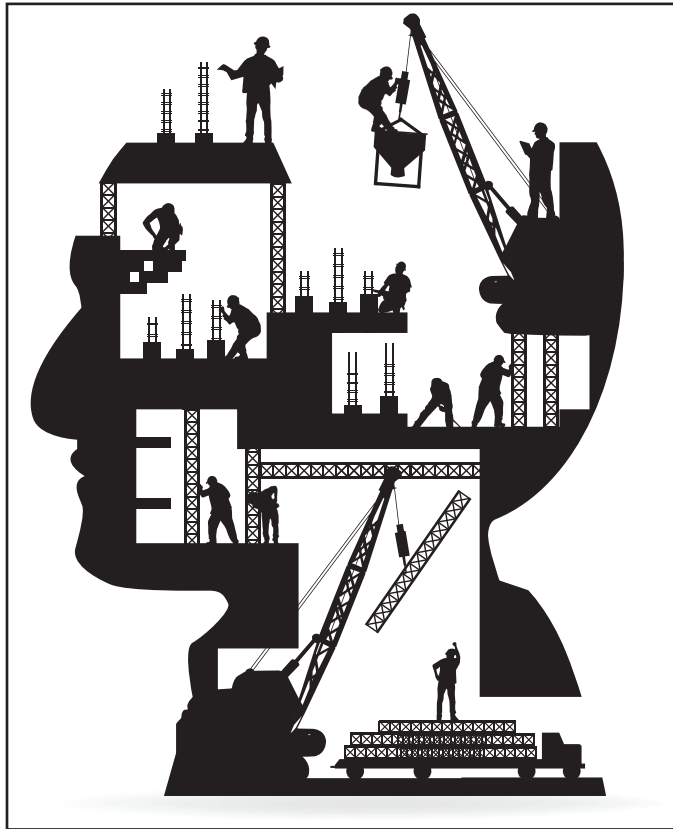
Period _____

Date _____

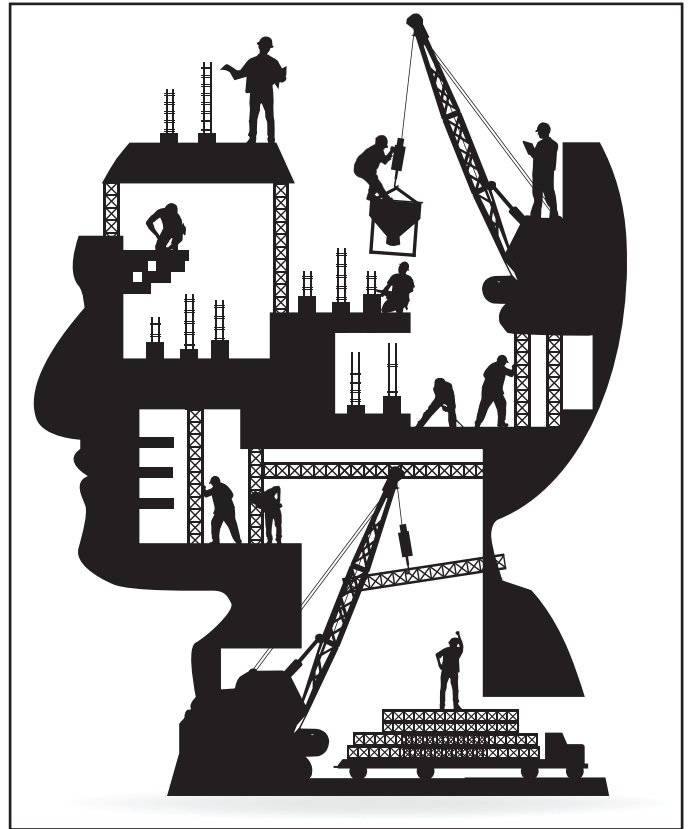
ON THE JOB: PHOTO PUZZLE HUNT

Individually or with your partner, find the differences between Pictures A and B. Be as descriptive as possible when describing the difference that Picture B has from Picture A.

A



B



Differences between picture A & B:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Lesson S1d

ON THE JOB: TOOLS OF THE TRADE (Mix, Match & Mingle)

SCIENCE TEKS OBJECTIVES	
§112.18	<p>6.4, 7.4, 8.4 Scientific investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. The student is expected to:</p> <p>(A) use appropriate tools to collect, record, and analyze information, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectrometers, timing devices, and other equipment as needed to teach the curriculum; and</p> <p>(B) use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.</p>

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	<p>4. The student evaluates skills for personal success. The student is expected to: (B) use interpersonal skills to facilitate effective teamwork; and (C) use a problem-solving model and critical-thinking skills to make informed decisions.</p> <p>2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (D) determine the impact of technology on careers of personal interest.</p> <p>7. The student develops skills for professional success. The student is expected to: (D) recognize the importance of a healthy lifestyle, including the ability to manage stress; and (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population.</p>

- Instructional Directions** **This activity is designed to take 15–25 minutes as presented below.**
1. Teacher should cut cards apart, laminate and place cards in an envelope or baggie.
 2. Students are placed into partnerships or small groups (no more than three is advised to allow all students ownership of a portion of the activity).
 3. Cards are given to student groups in an envelope. Each envelope contains a set of 10 pictures, 10 job names, and 10 descriptions/scenarios.
 4. Student groups spread cards out and observe/read.
 5. Students begin to match job names with descriptions by using context clues. Students should be advised that some safety “tools” could be used by more than one profession, but that in this activity, there is a best match for each job, description and picture using context clues.
 6. Once all pictures, job names, and description/scenarios are matched as the group deems correct, the group calls the instructor over to check their work.
- Learning Outcome(s)** The students will use observation and context clue reading skills to match a picture and also a verbal description of safety equipment to the job that uses it. The finished product here will be a set of three columns: job names, pictures of safety tools/equipment and a verbal description or scenario for the equipment’s use. In each row, the goal is for the student to match up the job, safety equipment and scenario correctly. Each picture will have a specific job and matching description/scenario. No writing involved in this activity.
- Related Industries/Occupations** Plumbers, Welders, Machinists, School Teachers, Dentists, Nurses, Radiologic Technologists, Computer Programmers, Software Developers and Accountants
- Deliverables** Students will ask teacher to check completed sets of job titles, description/scenarios and safety tool once all sets are complete in their group.
- Resources Needed** 1. Laminated sets of Tools of the Trade Mix Match and Mingle Activity Cards (Blackline Masters S1d.1)
 2. Envelopes for sets as they are cut apart (30 pieces)
 3. Key for teacher (Blackline Master S1d.2)



**Vocabulary or Concepts
(New and/or Challenging)**

- Relationships
- Attributes
- Classification
- Profession

MODIFICATIONS & EXTENSIONS

- Students interview parents on safety equipment that they use on their job.
- Students write an essay on the importance of safety training in the workplace.
- **Simplify:** Students could have a modified set of clues with key words underlined.
- **Simplify:** Scenarios attached to pictures. The only match is with the job name.

Adapted from Clear Creek ISD Mix, Match and Mingle activities: Classification, Ecology, Genetics

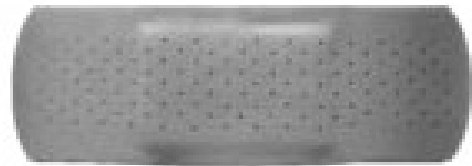


PLUMBERS

Work areas are not always easy to access or work in. In confined spaces, avoid oxygen deficient atmospheres, and monitor levels of hydrogen sulfide, a by-product of sewage decomposition. It can build up to unhealthy levels.

WELDERS

Protect eyes from radiation exposure. Infrared radiation can cause retinal burning and cataracts and it can usually be felt as heat. Ultraviolet radiation, which cannot be felt, can cause an eye-burn. This condition may not be apparent until several hours after exposure. It can cause extreme discomfort and can result in swelling, fluid excretion and temporary blindness.



MACHINISTS

SCHOOL TEACHERS

Using eye protection in the machine shop is the most important safety rule of all. Metal chips and shavings can fly at great speeds and distances and cause serious eye injury. Safety glasses must be worn when working with hand-cutting tools, since most hand-cutting tools are made of hardened steel and can break or shatter when used improperly.

These safety tools may become obsolete with more technology-driven, paperless assignments.



DENTISTS

Worn whenever contact with blood or other potentially infectious materials is likely to occur. Since saliva is considered a potential infectious material, these should be worn in almost all patient procedures and when touching contaminated items or surfaces.

NURSES

These workers have hands-on daily contact with their patients and therefore play a vital role in patient safety and infection control. The Center for Disease Control explains how hand-washing is the single most effective way to prevent the spread of infection.



RADIOLOGIC TECHNOLOGISTS

These workers are protected from radiation by using protective equipment such as lead shields, by following rigid safety procedures, and by wearing film badges to monitor exposure to radiation.



COMPUTER PROGRAMMERS

These workers can design instructions to cut and shape machine, automobile and aviation parts. They then input an instructional program into their machines to set guidelines for movement, cutting and shaping. Anyone seeking this profession should be capable of closely following safety measures, including wearing safety gear such as earplugs because machine tools can be hazardous.



SOFTWARE DEVELOPERS






ACCOUNTANTS

The American Academy of Ophthalmology also recommends that users should look up or away from their screens several times an hour. In addition, frequent blinking tends to lubricate the eyes and prevent them from drying out.

Some workplace injuries can happen from sitting in one place too long while making sure the company has accurate public records and its taxes are paid properly and on time. But there is a solution for this kind of fatigue.






MIX, MATCH AND MINGLE ACTIVITY CARDS

TEACHER KEY

<p>PLUMBERS</p>	<p>Work areas are not always easy to access or work in. In confined spaces, avoid oxygen deficient atmospheres, and monitor levels of hydrogen sulfide, a by-product of sewage decomposition. It can build up to unhealthy levels.</p> <p>http://www.statefundca.com/safety/safetymeeting/SafetyMeetingArticle.aspx?ArticleID=501</p>	
<p>WELDERS</p>	<p>Protect eyes from radiation exposure. Infrared radiation can cause retinal burning and cataracts and it can usually be felt as heat. Ultraviolet radiation, which cannot be felt, can cause an eye-burn. This condition may not be apparent until several hours after exposure. It can cause extreme discomfort and can result in swelling, fluid excretion and temporary blindness.</p> <p>http://www.lincolnelectric.com/en-us/education-center/welding-safety/pages/personal-protective-equipment-faqs.aspx</p>	
<p>MACHINISTS</p>	<p>Using eye protection in the machine shop is the most important safety rule of all. Metal chips and shavings can fly at great speeds and distances and cause serious eye injury. Safety glasses must be worn when working with hand-cutting tools, since most hand-cutting tools are made of hardened steel and can break or shatter when used improperly.</p> <p>http://machinist.org/army-machine-tool/general-machine-shop-safety/</p>	
<p>SCHOOL TEACHERS</p>	<p>These safety tools may become obsolete with more technology-driven, paperless assignments.</p>	
<p>DENTISTS</p>	<p>Worn whenever contact with blood or other potentially infectious materials is likely to occur. Since saliva is considered a potential infectious material, these should be worn in almost all patient procedures and when touching contaminated items or surfaces.</p> <p>http://www.ada.org/sections/professionalResources/pdfs/cdc_protective_equipment.pdf</p>	

MIX, MATCH AND MINGLE ACTIVITY CARDS

TEACHER KEY

<p>NURSES</p>	<p>These workers have hands-on daily contact with their patients and therefore play a vital role in patient safety and infection control. The Center for Disease Control explains how hand-washing is the single most effective way to prevent the spread of infection.</p> <p>http://www.juns.nursing.arizona.edu/articles/fall%202009/infection%20conrol.htm</p>	
<p>RADIOLOGIC TECHNOLOGISTS</p>	<p>These workers are protected from radiation by using protective equipment such as lead shields, by following rigid safety procedures, and by wearing film badges to monitor exposure to radiation.</p> <p>http://www.michigan.gov/healthcareers/0,4590,7-221-39742-63169-,00.html</p>	
<p>COMPUTER PROGRAMMERS</p>	<p>These workers can design instructions to cut and shape machine, automobile and aviation parts. They then input an instructional program into their machines to set guidelines for movement, cutting and shaping. Anyone seeking this profession should be capable of closely following safety measures, including wearing safety gear such as earplugs because machine tools can be hazardous.</p> <p>http://education-portal.com/become_a_cnc_programmer.html</p>	
<p>SOFTWARE DEVELOPERS</p>	<p>The American Academy of Ophthalmology also recommends that users should look up or away from their screens several times an hour. In addition, frequent blinking tends to lubricate the eyes and prevent them from drying out.</p> <p>http://consumer.healthday.com/encyclopedia/article.asp?AID=646385</p>	
<p>ACCOUNTANTS</p>	<p>Some workplace injuries can happen from sitting in one place too long while making sure the company has accurate public records and its taxes are paid properly and on time. But there is a solution for this kind of fatigue.</p> <p>http://www.inc.com/guides/2010/05/9-avoidable-workplace-health-safety-hazards.html/1</p>	

NEWTON'S LAWS: ENERGY ON THE JOB

SCIENCE TEKS OBJECTIVES	
§112.18	9. Force, motion, and energy. The student knows that the Law of Conservation of Energy states that energy can neither be created nor destroyed, it just changes form. The student is expected to: (C) demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy.
§112.19.	7. Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. The student is expected to: (B) illustrate the transformation of energy within an organism such as the transfer from chemical energy to heat and thermal energy in digestion
CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	<p>4. The student evaluates skills for personal success. The student is expected to: (B) use interpersonal skills to facilitate effective teamwork; (C) use a problem-solving model and critical-thinking skills to make informed decisions; and (D) use effective time-management and goal-setting strategies.</p> <p>7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills, (C) model characteristics of effective leadership, teamwork, and conflict management; (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and (F) complete activities using project- and time-management techniques.</p> <p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupations.</p>

Instructional Directions

This activity is designed to take **15–30 minutes for brainstorming; 10–45 minutes for skits depending on class size.**

1. Students have acquired background knowledge and comprehension of energy transformation that take place around us and the Law of Conservation of Matter (Energy).
2. Students are given a scenario from a particular job. (**Blackline Masters S2.1–S2.7**)
3. Students brainstorm energy transformations that take place in that scenario.
4. In the blank space on their worksheet, students draw out transformations using arrows to show direction of transfer.
5. Students create a pantomime (silent) skit of the transformations.
6. Students perform their skit for their classmates. Classmates try to guess which job is being shown.
7. Class discusses energy transformations shown in group's skit.

Learning Outcome(s)

The students will demonstrate knowledge and application of energy transformations in an activity by a given job.

Related Industries/Occupations

Scientist, Nurse, Doctor, Accountant, HVAC Specialist, Geoscientist, Licensed Vocational Nurse (LVN)

Deliverables

Acting out a pantomime demonstrating the scene given. A list of energy transformations found in the scene.

Resources Needed

Blackline Masters S2.1–S2.7 (This is where students will list their energy transformations.)

Vocabulary or Concepts (New and/or Challenging)

- Pantomime
- Energy
- Law of Conservation of Energy
- Energy transformations

MODIFICATIONS & EXTENSIONS

Video clips could be shown of a job in action. Students could describe or even draw energy transformations shown.



Date _____

Group Member Names _____

ENERGY TRANSFORMATION SKITS

As a group, read your situation and think about the energy transformations that may take place in the situation. One person in the group needs to draw the energy transformations with the actions your group will pantomime. Hand this paper to your teacher when time to practice is up. It must have the names of all your group members.

Group 1: Astronauts replace a “window” on the international space station that allows sunlight to enter the lab where the scientists are experimenting on growth plants in space.

When your group is called on, act out your situation. The audience will record on a piece of notebook paper what they think your situation is and the energy transformations that they saw. Your grade is based on:

- The energy transformations shown below on this page (with arrows correct)
- Appropriate participation in your group
- Showing a minimum of three energy transformations in your pantomime
- Making your situation obvious to your audience in your acting
- Your active participation in observing other groups

Date _____

Group Member Names _____

ENERGY TRANSFORMATION SKITS

As a group, read your situation and think about the energy transformations that may take place in the situation. One person in the group needs to draw the energy transformations with the actions your group will pantomime. Hand this paper to your teacher when time to practice is up. It must have the names of all your group members.

Group 2: A college nursing instructor is showing students how to give an immunization shot. A student attempts to give another student a shot and is too rough. The student receiving the shot screams in pain.

When your group is called on, act out your situation. The audience will record on a piece of notebook paper what they think your situation is and the energy transformations that they saw. Your grade is based on:

- The energy transformations shown below on this page (with arrows correct)
- Appropriate participation in your group
- Showing a minimum of three energy transformations in your pantomime
- Making your situation obvious to your audience in your acting
- Your active participation in observing other groups

Date _____

Group Member Names _____

ENERGY TRANSFORMATION SKITS

As a group, read your situation and think about the energy transformations that may take place in the situation. One person in the group needs to draw the energy transformations with the actions your group will pantomime. Hand this paper to your teacher when time to practice is up. It must have the names of all your group members.

Group 3: You eat a bad hamburger, become ill, go to see a doctor. He/She writes a prescription after examining you.

When your group is called on, act out your situation. The audience will record on a piece of notebook paper what they think your situation is and the energy transformations that they saw. Your grade is based on:

- The energy transformations shown below on this page (with arrows correct)
- Appropriate participation in your group
- Showing a minimum of three energy transformations in your pantomime
- Making your situation obvious to your audience in your acting
- Your active participation in observing other groups

Date _____

Group Member Names _____

ENERGY TRANSFORMATION SKITS

As a group, read your situation and think about the energy transformations that may take place in the situation. One person in the group needs to draw the energy transformations with the actions your group will pantomime. Hand this paper to your teacher when time to practice is up. It must have the names of all your group members.

Group 4: An accountant is trying to calculate the end-of-month expenses but her phone keeps ringing and no one is on the other end. Finally, her boss comes in and informs her that he has been trying to call her. They realize his phone is not working. He throws it out the window.

When your group is called on, act out your situation. The audience will record on a piece of notebook paper what they think your situation is and the energy transformations that they saw. Your grade is based on:

- The energy transformations shown below on this page (with arrows correct)
- Appropriate participation in your group
- Showing a minimum of three energy transformations in your pantomime
- Making your situation obvious to your audience in your acting
- Your active participation in observing other groups

Date _____

Group Member Names _____

ENERGY TRANSFORMATION SKITS

As a group, read your situation and think about the energy transformations that may take place in the situation. One person in the group needs to draw the energy transformations with the actions your group will pantomime. Hand this paper to your teacher when time to practice is up. It must have the names of all your group members.

Group 5: Your home's air-conditioning has gone out! UGH! You call an **HVAC** (home ventilation & air conditioning) **specialist** to come out and fix the problem. He finds that a huge weed has grown and become intertwined in the unit outside. He cuts it back and restores AC to your home! Thank goodness!

When your group is called on, act out your situation. The audience will record on a piece of notebook paper what they think your situation is and the energy transformations that they saw. Your grade is based on:

- The energy transformations shown below on this page (with arrows correct)
- Appropriate participation in your group
- Showing a minimum of three energy transformations in your pantomime
- Making your situation obvious to your audience in your acting
- Your active participation in observing other groups

Date _____

Group Member Names _____

ENERGY TRANSFORMATION SKITS

As a group, read your situation and think about the energy transformations that may take place in the situation. One person in the group needs to draw the energy transformations with the actions your group will pantomime. Hand this paper to your teacher when time to practice is up. It must have the names of all your group members.

Group 6: Geoscientists take seismic readings to determine what kind of rock is under the ground. They use computers to interpret that info and then show the petroleum technician where to drill on a map.

When your group is called on, act out your situation. The audience will record on a piece of notebook paper what they think your situation is and the energy transformations that they saw. Your grade is based on:

- The energy transformations shown below on this page (with arrows correct)
- Appropriate participation in your group
- Showing a minimum of three energy transformations in your pantomime
- Making your situation obvious to your audience in your acting
- Your active participation in observing other groups

Date _____

Group Member Names _____

ENERGY TRANSFORMATION SKITS

As a group, read your situation and think about the energy transformations that may take place in the situation. One person in the group needs to draw the energy transformations with the actions your group will pantomime. Hand this paper to your teacher when time to practice is up. It must have the names of all your group members.

Group 7: It's your grandpa's birthday. He lives in a nursing home. His LVN (Licensed Vocational Nurse) wheels him in the room. You get to light the candles on the cake and then help him blow them out before you all eat it.

When your group is called on, act out your situation. The audience will record on a piece of notebook paper what they think your situation is and the energy transformations that they saw. Your grade is based on:

- The energy transformations shown below on this page (with arrows correct)
- Appropriate participation in your group
- Showing a minimum of three energy transformations in your pantomime
- Making your situation obvious to your audience in your acting
- Your active participation in observing other groups

NEWTON'S LAWS: A LESSON IN FORCE

SCIENCE TEKS OBJECTIVES	
§112.19.	7. Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. The student is expected to: (A) contrast situations where work is done with different amounts of force to situations where no work is done such as moving a box with a ramp and without a ramp, or standing still;
§112.20.	6. Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. The student is expected to: (A) demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion; (B) differentiate between speed, velocity, and acceleration; and (C) investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.
CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	1. The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to: (B) explore the career clusters as defined by the U.S. Department of Education. 2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (C) develop and analyze tables, charts, and graphs related to career interests. 4. The student evaluates skills for personal success. The student is expected to: (C) use a problem-solving model and critical-thinking skills to make informed decisions; and (E) effectively use information and communication technology tools 7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills. 8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupations.
§127.4 c	2. The student explores pathways of interest within one or more career clusters. The student is expected to: (B) explore careers of personal interest; and (E) describe the technical-skill requirements for careers of personal interest. 6. The student explores labor market information. The student is expected to: (A) analyze national, state, regional, and local labor market information; and (B) cite evidence of high-skill, high-wage, or high-demand occupations based on analysis of labor market information.

Instructional Directions This activity is designed to take 45 – 60 minutes as presented below.

1. Students discover background information of the types of high-skill, high-demand jobs found in the Gulf Coast region (<http://tinyurl.com/menzpp9>)
2. Students can also review background information on Newton's Second Law through discussion of previous lessons or watching a video such as <http://tinyurl.com/kv2osp2>
3. Students will be given instructions to think of a contrasting situation related to one of the jobs on the video to show/illustrate Newton's Second Law: Force = Mass x Acceleration. Students select one. All groups can be given the same jobs or each group can have a different job/scenario. Students must then illustrate the contrasting scenarios.

* Example: The same nurse has to move two different patients from their beds to a gurney to get x-rays taken. The first patient is an elderly lady that weighs 90 lbs. (lesser mass). The second is a former Houston Texans player who weighs 295 lbs. (greater mass). To accelerate (move the same direction at the same speed), the nurse will have to use more force with the second patient – the one with the greater mass. Students could draw or find computer images to portray this contrasting scene that illustrates Newton's Second Law of Motion.

(NOTE: Ask students to avoid situations that involve gravity as most don't fully grasp the concept of gravity as a force yet.)



NEWTON'S LAWS: A LESSON IN FORCE

4. Illustrations can be computer-generated or hand-drawn.
5. Students will write a paragraph explaining how their illustration portrays Newton's Second Law.
6. Share final examples with the class. Discuss the accuracy of the concepts portrayed by the students.

Learning Outcome(s) Students will review the concept of Newton's Second Law. Students will also review the types of high-skill, high-growth jobs found in the Gulf Coast region. The students apply their comprehension of the law by creating an illustration of Newton's Second Law at work in a particular job related task. Each student will do his/her own illustration.

Related Industries/Occupations Any of those found in Workforce Solutions' High-Skill/High-Growth Jobs List

Deliverables Short essay illustrating example of Newton's Second Law.
Contributions can be individual or group assignments.

Resources Needed

IDEAL

- U.S. Department of Labor videos
- Focus On profiles (wrksolutions.com/jobs/focuson.html)
- High-Skill/High-Growth Jobs List (wrksolutions.com/jobs/doc/WFS-HSHG.pdf)
- Computers, Internet access for images, drawing paper, markers, map pencils

LIMITED RESOURCES

- Teacher provides paper-based information on pre-selected jobs from the High-Skill/High Growth Jobs List (wrksolutions.com/jobs/doc/WFS-HSHG.pdf)
- Students hand-draw illustrations on their essay page

Vocabulary or Concepts (New and/or Challenging)	• Force	• Sir Isaac Newton
	• Motion	• Newton's Second Law of Motion
	• Acceleration	• Portray
	• Mass	• Illustrate
	• Net force	• Effect
	• Direction of force	• Affect

MODIFICATIONS & EXTENSIONS

As students are watching the Department of Labor videos, teacher could pause to ask about forces found in each of the scenarios. Analysis questions:

- If more mass was added to _____ how would that affect the acceleration of _____?
- What would happen if more force was applied to _____?
- Students with higher math abilities can use the formula to make up word problems with realistic values to apply to their illustrated scenes. Word problems could be teacher created as well.
- **Simplify:** Students would not create their own illustrations. Examples could be teacher-generated showing:
 - a. the same force acting on different masses producing different acceleration rates.
 - OR –
 - b. different forces on the same mass producing different acceleration rates.
- **Simplify:** Students could write the paragraph of the application of Newton's Second Law to "On the Job" illustrations that could be provided.

Adapted from: Newton's Second Law Illustrations developed by N. Stewart



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Lesson S3a

A COLONY FOR LUNAR LIVING

SCIENCE TEKS OBJECTIVES	
§112.18	11. Earth and space. The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to: (C) describe the history and future of space exploration, including the types of equipment and transportation needed for space travel.

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (C) develop and analyze tables, charts, and graphs related to career interests. 4. The student evaluates skills for personal success. The student is expected to: (C) use a problem-solving model and critical-thinking skills to make informed decisions. 8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.
§127.4 c	1. The student explores one or more career clusters of interest. The student is expected to: (A) identify the various career opportunities within one or more career clusters. 2. The student explores pathways of interest within one or more career clusters. The student is expected to: (A) investigate career opportunities within the pathways. 6. The student explores labor market information. The student is expected to: (A) analyze national, state, regional, and local labor market information; (B) cite evidence of high-skill, high-wage, or high-demand occupations based on analysis of labor market information; and (C) analyze the effects of changing employment trends, societal needs, and economic conditions on career planning.

Instructional Directions

This activity is designed to take 25 – 45 minutes as presented below.

1. Read the scenario about living on the moon. Describe general ways life would be different on the moon.
2. Review the Workforce Solutions High-Skill, High-Growth Jobs List and determine 10 jobs that may transfer to lunar living.
3. Record your ideas and your reason(s) for selecting that job.
4. Record a different challenge for each occupation that might be unique to getting the job done considering the facts given about the moon.

Learning Outcome(s)

The students will understand living conditions on the moon by being able to justify the need for specific jobs needed for habitation of the moon.

Related Industries/Occupations:

All those found in Workforce Solutions High-Skill, High-Growth Jobs List

Deliverables:

Completed Blackline Master S3

Resources Needed:

- Workforce Solutions’ High-Skill, High-Growth Jobs List (wrksolutions.com/jobs/doc/WFS-HSHG.pdf)
- Blackline Master S3
- Lunar facts
- A computer to do more research, if needed

Vocabulary or Concepts (New and/or Challenging):

- Gravity
- Lunar month
- Maria
- Orbit
- Regolith
- Atmosphere



Lesson S3a

MODIFICATIONS & EXTENSIONS

- An activity could be created that has 20 jobs on it. Students would rank the jobs from one to 20 on the necessity of that job for the colonization of the moon. There could be a column for each to explain the justification of its given rank.
- Student choice justification written in a well-developed paragraph.
- Students could choose five jobs that may be obsolete with moon colonization and explain why.
- Create a moonscape skit with each group member representing a different job.
- Students could visit Space Center Houston to hear more about how NASA is preparing for lunar living.



Name _____

Period _____

Date _____

A COLONY FOR LUNAR LIVING

Life on earth is getting challenging. The earth's resources just can't seem to catch up with the ever-growing human population and the demand we put on the non-renewable resources that we have used for the "necessities" of our lives. NASA engineers have been exploring the possibility of lunar living for decades, but have renewed their efforts in the past few years with the goal of having colonies on the moon by the year 2020. Just like the early explorers to the new world, adaptations have to be made for new surroundings, new challenges and new resources that are available. Imagine that your family is one of the first families to actually live on the moon and not just visit.

BASIC MOON FACTS	
distance from the Earth	356,000 – 407,000 km
orbital speed	36,800 km/hr
temperature range (night-day)	-184 – 214 °C (-141 °F)
temperature at poles	constant -96 °C
revolution period	27.3 Earth days
rotation period	27.3 Earth days
equatorial diameter	3,476 km
gravitational pull	0.16 times the Earth's

Data assimilated from: <http://nssdc.gsfc.nasa.gov/planetary/factsheet/moonfact.html>

I. Use your schema and the given background facts on the moon to list five specific ways basic life will be different on the moon:

1. _____

2. _____

3. _____

4. _____

5. _____

Name _____

Period _____

Date _____

A COLONY FOR LUNAR LIVING CONTINUED...

- II. For life on the moon to be viable, an economy will have to be established. Therefore, there will be jobs for people to do and services that will be needed. Consider the Workforce Solutions High-Skill, High-Growth Jobs List. Determine 10 jobs that will be essential to basic living on the moon. Name each of these jobs and give a reason why your family would need the essential services of that particular job.

LUNAR ESSENTIAL JOB	JUSTIFICATION FOR THE NECESSITY OF THIS JOB
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

- III. Challenge: Choose five of the jobs above and list specific challenges that a person doing that job would encounter on the moon as opposed to living on earth.

LUNAR JOB	CHALLENGE OF DOING THIS JOB ON THE MOON
1.	
2.	
3.	
4.	
5.	

Lesson S3b: Technology Extension

SPACE SPIN-OFFS

SCIENCE TEKS OBJECTIVES

§112.18	11. Earth and space. The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to: (C) describe the history and future of space exploration, including the types of equipment and transportation needed for space travel.
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CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES

§127.3 c	<p>1. The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to: (C) summarize the career opportunities in a cluster of personal interest; and (D) research current and emerging fields related to personal interest areas.</p> <p>2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (D) determine the impact of technology on careers of personal interest.</p> <p>7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills.</p> <p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.</p>
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Instructional Directions

This activity is designed to take 1 – 3 hours, including writing; additional hours (2 –6) if app developed.

1. Have students use information from spinoff.nasa.gov to look at things developed for space use by NASA that have been used by industry/individuals applying this space technology to new things.
2. Choose 10 jobs that you can connect to 10 of these spin-offs.
– OR –
Research tools and processes used in a given job and describe how that could be used on the moon.
3. Describe what the limitations would be considering the difference in gravity between the earth and the moon.
4. Have students write a 1–2 page paper summarizing their conclusions/findings based on the instructional direction you have chosen.

Learning Outcome(s)

Students will identify space materials & processes that have been used in space history and then applied to industry/everyday living.

Related Industries/Occupations

All those found in the Workforce Solutions' High-Skill, High-Growth Jobs List

Deliverables

1–2 page paper OR this could be a paperless activity for discussion

Resources Needed

Computer(s) to view NASA website, Workforce Solutions High-Skill, High-Growth Jobs List

Vocabulary or Concepts (New and/or Challenging)

- Spinoff
- Velcro
- Any other term used in conjunction with the spinoffs

MODIFICATIONS & EXTENSIONS

Consider having students use a web-based app development tool (such as Infinite Monkeys: www.infinitemonkeys.mobi) to share their findings or introduce a solution to one of the identified resource challenges.



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SIMPLE MACHINE SCAVENGER HUNT

SCIENCE TEKS OBJECTIVES

§112.18	8. Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to: (E) investigate how inclined planes and pulleys can be used to change the amount force to move an object.
---------	---

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES

§127.3 c	2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (C) develop and analyze tables, charts, and graphs related to career interests; and (D) determine the impact of technology on careers of personal interest. 4. The student evaluates skills for personal success. The student is expected to: (C) use a problem-solving model and critical-thinking skills to make informed decisions; and (F) identify skills that can be transferable among a variety of careers.
----------	--

Instructional Directions This activity is designed to take 30–45 minutes as presented below.

1. Students review simple machines. Teachers review just simple machines that apply to their curriculum.
2. Students are given pictures of Workforce Solutions high-skill, high-growth jobs and challenged to hunt for simple machines found in these pictures. (You may use pictures from **Blackline Masters S1a and S1d** or any of your choosing.) This activity should be timed. This could be done in pairs or in a larger group depending on the number of copies of pictures you have. Students list simple machines found in each pic.
3. Students are then challenged to use Workforce Solutions’ High-Skill, High-Growth Jobs List to hypothesize which picture fits with which job.

Learning Outcome(s) The students will be able to identify simple machines at work in jobs pictures. Students will become more aware of the types of jobs available in the Gulf Coast region.

Related Industries/Occupations All those found in Workforce Solutions’ High-Skill, High-Growth Jobs List

Deliverables This could be a paperless activity for discussion or students could complete the Simple Machines Scavenger Hunt Activity. (**Blackline Master S4**)

- Resources Needed**
- Same photos from Blackline Master S1a & S1d
 - Blackline Master S4
 - Workforce Solutions’ High-Skill, High-Growth Jobs List

- Vocabulary or Concepts (New and/or Challenging)**
- | | | |
|-------------------|------------------|------------------|
| • Scavenger hunt | • Inclined plane | • Wheel and axle |
| • Strategy | • Pulley | • Wedge |
| • Simple machines | • Lever | • Screw |

MODIFICATIONS & EXTENSIONS

Teacher could make up a scavenger hunt for his/her own school building by writing clues to discover specific simple machines found on his/her campus. (For example, one item to find might be “locate the simple machine found to the left of the entrance to the gym.”)

Adapted from: Simple Machine Scavenger Hunt developed by N. Stewart



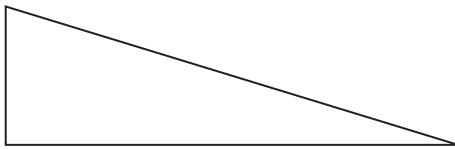
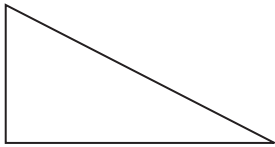
Name _____

Period _____

Date _____

SIMPLE MACHINES

INCLINED PLANE



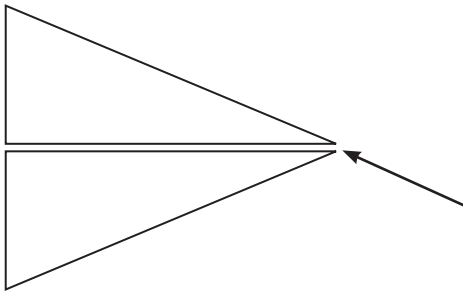
More distance, less force

DESCRIPTION

(Which job is using or might use this machine? What does it look like, what does it do, how does it work? Give an example.)

- Increase the distance over which you exert force to decrease the size of the force
- No moving parts
- Mechanical advantage of an inclined plane increases as slant of plane decreases

WEDGE



DESCRIPTION

(Which job is using or might use this machine? What does it look like, what does it do, how does it work? Give an example.)

- Moving incline plane
- Greater distance, less force (longer thinner wedge, less effort)
- 2 wedges put together – knife, ax
- Lock, key – series of wedges, zipper

SCREW



DESCRIPTION

(Which job is using or might use this machine? What does it look like, what does it do, how does it work? Give an example.)

- Inclined plane wrapped around a central bar, or cylinder to form a spiral
- Multiplies effort force by acting through a longer distance
- Closer threads – more distance, less force

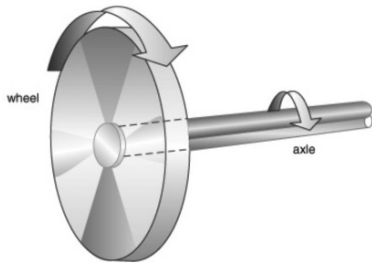
Name _____

Period _____

Date _____

SIMPLE MACHINES CONTINUED...

WHEEL AND AXLE



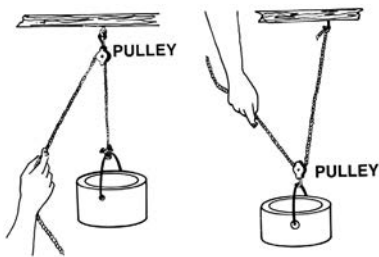
THE WHEEL AND AXLE IS A WHEEL CONNECTED TO A RIGID POLE.

DESCRIPTION

(Which job is using or might use this machine? What does it look like, what does it do, how does it work? Give an example.)

- Two circular objects of different sizes working together
- Wheel moves greater distance than axle
- The greater the difference in size between the wheel and axle, the greater the mechanical advantage

PULLEY

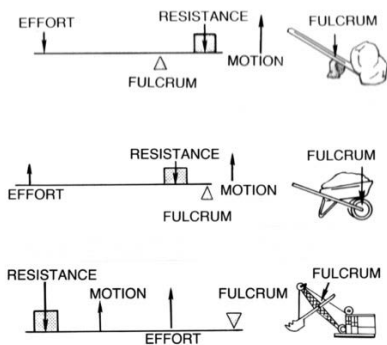


DESCRIPTION

(Which job is using or might use this machine? What does it look like, what does it do, how does it work? Give an example.)

- Rope, belt, chain around grooved wheel
- Mechanical advantage: Changes direction or amount of force
- Increase mechanical advantage, by adding another pulley to create a pulley system

LEVER



DESCRIPTION

(Which job is using or might use this machine? What does it look like, what does it do, how does it work? Give an example.)

- Rigid bar, free to move around a fixed point (fulcrum)
- Decrease distance, changes direction of force
- Divided into three classes depending on location of fulcrum and forces (effort force and resistance force)

DISCOVER YOUR INTERESTS SHOWCASE

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3.c	<p>1. The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to: (A) complete, discuss, and analyze the results of personality, career interest, and aptitude assessments.</p> <p>2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (A) create a personal career portfolio; (E) identify entrepreneurial opportunities within a field of personal interest.</p> <p>7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills.</p>
§127.4.c	<p>2. The student explores pathways of interest within one or more career clusters. The student is expected to: (A) investigate career opportunities within the pathways; (B) explore careers of personal interest.</p> <p>4. The student explores the professional skills needed for college and career success. The student is expected to: (C) develop a personal six- or eight-year achievement plan that incorporates rigorous academic and relevant enrichment courses; (E) identify professional associations affiliated with a specified program of study; (F) employ effective leadership, teamwork, and conflict management.</p>

Instructional Directions This activity is designed to take 20–35 minutes as presented below.

1. Define “Career Exploration” for students. This is the process of aligning interests to possible job options, identifying appropriate educational and lifestyle choices, and considering options for achieving their career goals. Discuss with students how they might explore careers, what careers they are considering, and why they currently have these ideas.

2. Discover Your Interests – Direct the discussion to lead students to considering their interests and strengths as a starting point for discovering career opportunities.
 - A. Give examples of strengths/character qualities, such as:
 - a. Compassionate listener
 - b. Outgoing encourager
 - c. Problem solving investigator
 - B. Have students complete the Discover Your Interests Worksheet (**Blackline Master C1**)
 - a. Review questions for understanding
 - b. Allow time for completion. Students may consult peers as appropriate or desired based on the nature of the question.

3. Showcase Your Talent
 - A. Have students select one question from the worksheet to share with the class. For example, if a student chooses to share that their friends compliment their talent as a poet, they might share a poem. If they are good in science, they might build something or share an odd science fact.
 - B. Give options in method of sharing
 - a. Perform the skill or talent
 - b. Work a problem on the board
 - c. Display a piece of art work
 - d. Other options as defined by the student and approved by the teacher



DISCOVER YOUR INTERESTS SHOWCASE

Learning Outcome(s) Students will be able to determine what talents others may recognize in them, identify qualities they admire in others that they possess, acknowledge positive actions that gave them a sense of accomplishment, identify how interests may turn into occupations.

Deliverables

- completed Blackline Master C1
- demonstrable skill or talent for showcase

Resources Needed

- Blackline Master C1

**Vocabulary or Concepts
(New and/or Challenging)**

- Career Exploration

MODIFICATIONS & EXTENSIONS

- **School-to-Home Connection:** Interview 2 adults (teacher, parent, adult friend) about their impression of the student (ref. question 2 on worksheet) Ask parent or guardian how they chose their career and how it matches their interests or strengths.
- **Technology-Driven:** Complete the Choices Career Planner Interest Inventory Test from Workforce Solutions (<http://www.wrksolutions.com/cp/homepage.html>) and have students compare the interests revealed in this inventory with those on their worksheet. Have students write a summary essay or create a presentation to discuss their new findings.



Name _____

Period _____

Date _____

DISCOVER YOUR INTERESTS

1. Good friends count on each other for many things. What do YOUR friends count on you for or what do they often compliment you about? (not counting looks)

2. What PRAISE or acknowledgement have you gotten from your teachers?

3. What are your favorite subjects and why?

4. Identify three people you admire. Name THREE QUALITIES or characteristics in each of these people that you most respect or admire. Circle the qualities that you named that are also true about YOU. How do you show these characteristics?

5. Describe something you DESIGNED, CREATED, built, made, or fixed up, that gave you a strong sense of satisfaction. Tell why you feel good about it.



EGG-STREME SPORTS

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3.c	<p>2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (C) develop and analyze tables, charts, and graphs related to career interests; (E) identify entrepreneurial opportunities within a field of personal interest.</p> <p>4. The student evaluates skills for personal success. The student is expected to: (B) use interpersonal skills to facilitate effective teamwork; (C) use a problem-solving model and critical-thinking skills to make informed decisions; (D) use effective time-management and goal-setting strategies; (F) identify skills that can be transferable among a variety of careers.</p> <p>7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills; (C) model characteristics of effective leadership, teamwork, and conflict management; (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population and; (F); complete activities using project- and time-management techniques.</p> <p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (A) complete actual or virtual labs to simulate the technical skills required in various occupations and; (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.</p>
§127.4.c	<p>1. The student explores one or more career clusters of interest. The student is expected to: (A) identify the various career opportunities within one or more career clusters; and (B) identify the pathways within one or more career clusters.</p> <p>2. The student explores pathways of interest within one or more career clusters. The student is expected to: (A) investigate career opportunities within the pathways; (E) describe the technical-skill requirements for careers of personal interest.</p> <p>4. The student explores the professional skills needed for college and career success. The student is expected to: (F) employ effective leadership, teamwork, and conflict management; (H) demonstrate characteristics required for personal and professional success, including work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population.</p> <p>6. The student explores labor market information. The student is expected to: (A) analyze national, state, regional, and local labor market information; (B) cite evidence of high-skill, high-wage, or high-demand occupations based on analysis of labor market information.</p>

Instructional Directions

This activity is designed to take 45 minutes – 1.5 hours as presented below. In this lesson, students will experience career activities before discussing and analyzing their actions. Allowing time for the analysis is critical for quality learning outcomes.

1. Scenario (Read aloud or use your best storytelling ability to set up the scenario)

There is a new extreme sport that Eddie the egg, and dozens of his friends are passionate about. They are free falling from various heights. Their problem is in the landing. They enjoy the sport but have had several friends scramble their brains in the process. They like to free fall so they like nothing wrapped around them, hence no parachute, etc.

Your company is going to capitalize on this new sport by building a structure to place on the floor where Eddie and his friends can land safely. You will build a prototype competing with several other companies. In order to get the business you need to not only build a working structure but have good advertising and promotional materials.
2. Construction
 - A. Arrange students in small groups (4–5 students; less or more as appropriate to class size)
 - i. Groups may choose to divide the tasks or work as one unit.
 - B. Materials for prototype
 - i. Pass out 2 pieces of newspaper, 6 inches of tape, 4 straws and 1 raw egg to each group.
 - ii. To keep it “fair,” the groups must only use the materials given in the construction.
 - iii. To be sure no group just uses wadded up newspapers, they must use all of the supplies given to them.



EGG-STREME SPORTS

C. Marketing strategy

- i. Decide on a name for the company
- ii. Create a slogan/tag line
- iii. Any additional advertising strategies
- iv. Develop a commercial (time permitting)

D. Organizational plan

- i. Since this is a start-up company, staff must be limited. What are the five critical positions? Why?

E. Customer service

- i. The customer/egg must be treated well at every stage of the process
- ii. He/she may be pampered (decorated) but not damaged

3. Pitch (Company Presentations) & Product Testing

F. Organizational plan

- i. Have groups list the five jobs in their start-up company and why they chose those positions
- ii. Evaluate for effectiveness – may create a rubric for evaluations as time permits

G. Marketing strategy

- i. Have groups present marketing items from the marketing strategy expectations above
- ii. Evaluate for effectiveness – may create a rubric for evaluations as time permits

H. Prototype

- i. Upon completion of the structure each group will place it on the ground
- ii. One member of each group will step forward, place the egg at waist height and at the same time let the eggs free fall into the structure
- iii. Examine the egg for cracks. Eggs without cracks may jump again, but a different group member should drop the egg and/or the height from which the egg is dropped should be changed (elbow height, shoulder height, or have students step up on a higher [safe] platform).
- iv. Continue until all members have dropped the egg, one non-cracked egg remains, or all eggs are cracked (up to teacher discretion)
- v. Ideally, one team will remain with an uncracked egg. This is the winner of the contract! Ties should be broken by the quality of the marketing presentation.

4. Analyze & Summarize – *instructional time should allow for at least one of these synthesizing activities*

I. Application to the workforce:

- i. Suppose you were to create this company. What occupations/positions/jobs would you need for people to have in order for the company to be successful?
- ii. Have each group create a list of occupations their company would need

J. High-Skill, High-Growth Jobs List (wrksolutions.com/jobs/doc/WFS-HSHG.pdf)

- i. Introduce the guide
- ii. Ask student to compare the guide to their “company staff”
 1. If there are positions on the guide put a star next to them
 2. If there are positions they want to add, do so



EGG-STREME SPORTS

I. Share lists with class and make one “ideal” list of occupations needed for the best company

J. Construction

- i. What worked well in this phase?
- ii. What could they have done differently?

K. Companies

- i. What would be the company’s biggest obstacle in being successful?
- ii. Direct students to the observation that companies are made up of many occupations, some more or less obvious than others. Their ideal job may exist where they least expect it.

Learning Outcome(s) Students will be able to identify occupations needed to form a successful company, from occupations identified through their project development. The project is designed to highlight jobs that are high-skill, high-growth, apply engineering and mathematical principals to build a structure, use effective communication tools to create company marketing materials, and introduce business acumen to make decisions about the organizational structure of a company.

Deliverables

- Egg construction prototype
- Marketing strategy and pitch
- List of vital occupations
- Any other deliverables you might want to add to increase exploration of different jobs within context

Resources Needed IDEAL
Newspaper, tape, straws, eggs, paper towels, trash can, High-Skill, High-Growth Jobs List, chart paper, markers, materials used for “marketing the company”, steps to test structure from various heights

LIMITED
Newspaper, tape, straws, eggs, paper towels, trash can, High-Skill, High-Growth Jobs List

Vocabulary or Concepts (New and/or Challenging)

- Prototype
- Marketing Strategy
- Organizational Chart/Plan
- Hierarchy

MODIFICATIONS & EXTENSIONS

- **Extensions:** Have students calculate based upon time spent in construction, materials used, salaries of employees and demand how much they should charge for the structure? How many would they need to sell in order to make a profit? Evaluate success of the “marketing strategies” using a determined rubric.
- **Technology-Driven:** Using the “Focus On Profiles,” explore the high-skill, high-growth jobs used in this activity. Research the business development around other extreme sports. Have students prepare presentations on other products they might develop to support these sports.



REALITY CHECK

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES

§127.3.c	<p>2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (B) make oral presentations that fulfill specific purposes using appropriate technology; (C) develop and analyze tables, charts, and graphs related to career interests; (D) determine the impact of technology on careers of personal interest; (E) identify entrepreneurial opportunities within a field of personal interest.</p> <p>3. The student analyzes college and career opportunities. The student is expected to: (A) determine academic requirements for transition from one learning level to the next; (B) explore opportunities for earning college credit in high school such as Advanced Placement courses, International Baccalaureate courses, dual credit, and local and statewide articulated credit.</p> <p>5. The student recognizes the impact of career choice on personal lifestyle. The student is expected to: (A) prepare a personal budget reflecting the student's desired lifestyle; (B) use appropriate resources to compare and contrast salaries and educational requirements of at least three careers in the student's interest area; (C) evaluate at least three career interests based on budget and salary expectations.</p>
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Instructional Directions This activity is designed to take 30 minutes – 2 hours as presented below. Additional time can be allotted if a project-based demonstration of learning is chosen as the students' deliverable.

This lesson can be completed in a number of different ways depending on technological resources available. Please consider the appropriate direction for:

- A. a classroom with one internet-accessible computer;
- B. a classroom (lab) with multiple computers so that students could work individually or in pairs; or,
- C. a classroom with no computers.

Blackline Masters C3a and C3b are used for all three options and are necessary to complete option C, as it replaces the online interface.

Please note: It is advisable that teachers check for accessibility and use of the Web site www.texasrealitycheck.com prior to beginning this lesson. The website has three activity options. We will be using the activity titled "Reality Check," or option 1 using the free download Apple app.

1. Student should now complete the appropriate Reality Check:

- A. One computer
 - a. One person (teacher or student) operates the program depending upon time limitation. Students can call out their selections as the person running the program makes the chosen selections on the Web site.
 - b. Each student completes a Reality Check worksheet (**Blackline Master C3a**) reflecting their individual choice. This should not match what is being done collectively as a class (unless their answers are identical) as each student's complete worksheet will yield an individual result about their lifestyle choices.
- B. Multiple computers
 - a. Each student completes the online activity and records their answers on the Reality Check worksheet (**Blackline Master C3a**) reflecting their choice.
 - b. Have students write their expected annual salary on their worksheet.
- C. No computers
 - a. Each student completes a worksheet (**Blackline Master C3a**) reflecting their choices.
 - b. Determine the total number of points for their choices.



REALITY CHECK

2. Students should then write down the salary (range) they must achieve to afford the lifestyle they have selected. The website provides a salary range and a link to consider careers that might provide this salary. For students doing the paper activity, they will need to reference the Reality Check Results Grid (**Blackline Master C3b**). All occupations on the grid are from the Workforce Solutions High-Skill, High-Growth Jobs List (wrksolutions.com/jobs/doc/WFS-HSHG.pdf), which should be introduced to students as a reference in their decision making.

In either case, this is a good time to open a discussion about how the students' lifestyle choices affected the available careers and salaries. Depending on the teacher's discretion and time allotted for the lesson, students might be allowed to change choices to allow different career options.

— The lesson can be broken into two smaller units by stopping at this point —

3. Students should now research the occupation (using Focus On Profiles – wrksolutions.com/jobs/focuson.html)
- A. Multiple computers
 1. Have student find their occupation from the list of Focus On Profiles
 2. Complete the Focus on Profile Worksheet (**Blackline Master C3c**)
 - B. One computer or none
 1. Provide hard copies of Focus On Profiles for each student to choose from, or
 2. Break into groups and work on an occupation as a team
 3. Complete the Focus on Profile Worksheet (**Blackline Master C3c**)
4. Summarize – Using all completed worksheets, the students should summarize their findings:
- A. Review Focus On Profile worksheet as a class and direct a discussion on choices and outcomes regarding money, education, and career decisions; or,
 - B. Have students create presentations on their chosen occupations. These can be oral, essays, group presentations, posters, or any deliverable deemed appropriate by the teacher. Students should include information on:
 1. how they chose the profession they researched
 2. what mattered most in choosing their career
 3. how influential were salary and expenses in considering their options
 4. what educational steps should they take next
 5. where might they look for a job (include specific companies and industries) when they have completed their education.

Learning Outcome(s) Students will calculate their cost of living, determine a high-skill, high-growth job that would meet their cost of living, and investigate their determined occupation.

Deliverables

- Completed Blackline Masters C3a-c
- Occupation presentation or paper

Resources Needed IDEAL: One computer for each student with access to Internet, Blackline Master C3a, materials for creating presentations (poster boards, markers, etc.)

LIMITED: Reality Check Worksheet and Results Grid (Blackline Masters C3a and b), “Focus On Profiles” from Workforce Solutions Web site, Focus On Profile worksheet (Blackline Master C3c)

Vocabulary or Concepts
(New and/or Challenging)

- Cost of living
- High-skill, high-growth occupation
- Post-secondary education
- Student loans
- Public school
- Private school
- For-profit (proprietary) school



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Name _____

Period _____

Date _____

REALITY CHECK WORKSHEET

Directions:

1. For each box above you are going to choose one or more options for lifestyle expenses you might choose to have when you have your first full-time job after high school or college.
2. If the box says "Choose 1," then you would only choose one option. For example: for housing, choose the line that matches the type of housing you would like to have. If you want to rent a one-bedroom apartment, you would circle 5 next to this choice.
3. For boxes where you can choose more than one option, feel free to choose as many as you think you need or want. For example, for entertainment, if you plan to go out with friends in town and also take short vacations, you should circle the corresponding number next to both of these options for a total of five.
4. Total the number of circled points and write the answer in the final space. Using the Reality Check Results Grid, find the column that matches your number of points and write down the salary range for that column in the box above. Next, choose one or more occupations you might consider to achieve this salary.

Reality Check may be found at www.texasrealitycheck.com or as an application for Apple products (Android coming soon).

Housing <i>(choose 1)</i>	
Living at home	0
None	0
Efficiency apartment	4
One-bedroom apartment	5
Two-bedroom apartment	6
House	6

Utilities <i>(may choose more than 1)</i>	
Phone	1
Internet	2
Mobile phone	2
Cable	2
Electricity	3
Water & gas	4

Food <i>(choose 1)</i>	
Eat at home	3
Home and fast food	4
Home and fine dining	4
Restaurants mostly	5

Transportation <i>(choose 1)</i>	
Walking	0
None	0
Public bus	1
Used auto	3
Basic auto	5
Average auto	6
Luxury auto	8

Clothing <i>(may choose more than 1, but only 1 option from choices 3-6)</i>	
Accessories	1
Shoes	1
\$50-75/month	2
\$76-125/month	2
\$126-250/month	3
\$250+/month	4

Health Care <i>(choose 1)</i>	
No insurance	1
Basic insurance (I)	2
Premium insurance (II)	4
<i>No insurance means no paycheck deduction but you will pay full price for each medical visit or service. Basic insurance may be less from your paycheck, but you will pay more per visit than premium insurance.</i>	



Name _____

Period _____

Date _____

Personal <i>(may choose more than 1)</i>	
Basics (toiletries, etc.)	1
Gym/sports recreation	2
Hair and skin services.....	2
Extras (makeup, cologne)	3
Luxuries (designer brands)	4

Entertainment <i>(may choose more than 1)</i>	
Stay home	1
Go out on the town at least once a week	2
Spend money on concert tickets, short out-of-town trips, and other items that cost more than a night on the town	3
Longer vacations and premium adventures that might require hotel and travel expenses	3

Miscellaneous <i>(may choose more than 1)</i>	
Misc. (small purchases)	1
Pet care	2
Vacation spending (aside from the cost of booking hotels and travel)	3
Gadgets (electronics)	4
Home furnishings (decorations, sheets, tables, etc.)	5

Savings per Check <i>(choose 1)</i>	
2%	1
5%	2
7%	2
10%	3

Student Loan <i>(choose 1)</i>	
Certificate	1
Associates	1
Bachelor's	2
Master's	4
Professional	5

Total Points
Salary Range
Possible occupations for my chosen lifestyle

REALITY CHECK RESULTS GRID

Based on your total from the Reality Check Worksheet, review the occupations which would allow you to live that lifestyle.

Total points from Reality Check Worksheet									
29 or less \$30-40k	30-39 \$41-50k	40-49 \$51-60k	50-59 \$61-79k	60-69 \$71-80k	70-79 \$81-90k	80-89 \$91-100k	90 or more \$101k+		
Machinist	Boilermaker	Accountant and Auditor	Cost Estimator	Financial Analyst	Computer Systems Analyst	Software Developer, Applications	Pharmacist		
Medical Records Technician	Electrician	Educational, Vocational and School Counselor	Electrical and Electronic Engineering Technician	Computer Systems Administrator	Environmental Engineer		Dentist		
Mobile Heavy Equipment Mechanic	Geological Technologist	Electrical Power-line Installer and Repairer	Medical and Clinical Laboratory Technologist	Registered Nurse (RN)	Physical Therapist		Doctor		
Rig Operator	HVAC Mechanic and Installer	Market Research Analyst	Chemical Plant Operator	Occupational Therapist	Software Developer, System Software		Geoscientist		
Weilder, Cutter, Solderer & Brazier	Industrial Machinery Mechanic	Paralegal	Speech Therapist	Nursing Instructor			Petroleum Engineer		
	Licensed Practical & Licensed Vocational Nurse (LPN & LVN)	Radiologic Technologist	Petroleum Pump System Operator, Refinery Operator, & Gauger				Mining /Geological Engineer		
	Plumber, Pipefitter, Steamfitter	Respiratory Therapist							
	Bilingual Teacher								

Read the "Focus On" profile to get more information on occupations that may interest you. Profiles can be found at <http://www.wrksolutions.com/jobs/focuson.html>.



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Name _____

Period _____

Date _____

FOCUS ON YOUR CAREER

YOUR CAREER CHOICE FOR TODAY

1. What will you do in this occupation? (Summarize the duties and day-to-day activities in this job.)

2. What percent of increase do they expect in the field by 2018?

3. How many new workers do we need in this occupation each year?

4. What is the stated salary or salary range for this position?

(If none is stated, you will have to do some research to get a salary range to complete this question.)

5. How much education or training is needed for the position?

6. According to this handout how many places offer this training? Name two.

7. How many major employers are listed as needing this position? Name two.

8. What courses could help prepare you for this career?



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SURVIVOR ISLAND – HOUSTON/GALVESTON

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3.c	<p>1. The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to: (B) explore the career clusters as defined by the U.S. Department of Education; (C) summarize the career opportunities in a cluster of personal interest; (F) explore how career choices impact the balance between personal and professional responsibilities.</p> <p>2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (D) determine the impact of technology on careers of personal interest; and (E) identify entrepreneurial opportunities within a field of personal interest.</p> <p>3. The student analyzes college and career opportunities. The student is expected to: (A) determine academic requirements for transition from one learning level to the next; (D) discuss the impact of effective college and career planning; (E) demonstrate decision-making skills related to school and community issues, programs of study, and career planning.</p> <p>4. The student evaluates skills for personal success. The student is expected to: (B) use interpersonal skills to facilitate effective teamwork; (C) use a problem-solving model and critical-thinking skills to make informed decisions; (D) use effective time-management and goal-setting strategies; (E) effectively use information and communication technology tools; and (F) identify skills that can be transferable among a variety of careers.</p> <p>7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills; (B) evaluate the impact of positive and negative personal choices, including use of electronic communications such as social networking sites; (C) model characteristics of effective leadership, teamwork, and conflict management; (D) recognize the importance of a healthy lifestyle, including the ability to manage stress; (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and (F) complete activities using project- and time-management techniques.</p> <p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.</p>
§127.4.c	<p>1. The student explores one or more career clusters of interest. The student is expected to: (A) identify the various career opportunities within one or more career clusters; and (B) identify the pathways within one or more career clusters.</p> <p>3. The student explores programs of study. The student is expected to: (B) identify the academic and technical skills needed.</p> <p>6. The student explores labor market information. The student is expected to: (A) analyze national, state, regional, and local labor market information; (B) cite evidence of high-skill, high-wage, or high-demand occupations based on analysis of labor market information; and (C) analyze the effects of changing employment trends, societal needs, and economic conditions on career planning.</p>

Instructional Directions This activity is designed to take 45 minutes – 1 hour as presented below.

1. Current Career Choice
 - A. Depending on class size, arrange students in small groups of four or more (ideally – adapt group size for smaller or larger classes as deemed appropriate)
 - B. Using the Career Choice ticket (**Blackline Master C4**), have students write down their **current career choice** and why.
 - C. Have students share their choices within the small groups
 - D. Once complete, proceed to step 2
2. Survivor Island – Small and Large Group Activity
 - E. Scenario – (You may read aloud to class or “embellish” as you feel qualified.)

After entering their chosen professions, the small group travels on a plane together. It crashes on a deserted island. Others have crashed there as well. The island can only sustain _____ number of people (change this number to represent two for each group, so if there are four groups, the number would be 4 x 2 or 8).

- F. Decisions
 - i. Based upon their occupation, the small group must decide which two people from their group can remain. The others are fed to the sharks!



SURVIVOR ISLAND – HOUSTON/GALVESTON

- ii. Share with class compiling one big list of who is on the island and their respective occupations. (Write this on the board or somewhere the entire class can view.)
 - iii. Ask class: “Would this island be successful with these occupations? Why? Why not?”
3. Rescued – Individual Activity
- G. Scenario – Bad News, Good News
 - i. (You may read aloud or, again, use your best storytelling ability.)

A tsunami is coming! The good news is that the sharks are scared away. The bad news is now everyone is in trouble. However, a ship is arriving from the port in the Houston/Galveston area and can harbor some castaways. However, the ship will only accept passage of those with certain professions that their community and economy needs.
 - H. Pass out the High-Skill, High-Growth Jobs List (wrksolutions.com/jobs/doc/WFS-HSHG.pdf)
 - I. Decisions – ask students:
 - i. Is your chosen career on this list? If so, great! Why do you think your career is on the list?
 - ii. If not, which position would you choose to pursue to get rescued?
 - iii. Why would you choose this career?
 - J. Have students write their **new career** on the ticket in the appropriate blank (even if it didn't change)
 - K. Share with class – writing the new choices next to the original list of island inhabitants
 - L. Compare and contrast the two lists:
 - i. Can _____ make more money in their new career?
 - ii. What skills or interests are shared between the original career and the new career? (Encourage connections students might not see. For example, a student might choose to be a teacher instead of a singer. Point out that both perform for “audiences” and have to prepare to perfect their performances.)
 - iii. For students that have chosen a HSHG career from the beginning, encourage them to share why they have done this and inquire about what they are doing to prepare for that career.
4. Summarize – Large Group
- M. Direct the discussion to summarize findings. Guide to the following:
 - i. Career choices can be made based upon interests (like the choice they came in with today) or the needs of the group (for example, those on the island or the need of the Houston/Galveston region as seen in the HSHG Guide)
 - ii. Information is available that projects (predicts) what industries and occupations will be in demand for the Gulf Coast region. Encourage the students to explore career options in the guide and share with their families and friends.

Learning Outcome(s)	Students will recognize how the need for occupations may vary according to the community, consider a career choice based upon labor market information, and become familiar with the High-Skill, High-Growth Jobs List.
Deliverables	Completed Blackline Master C4; lists of vital occupations
Resources Needed	High-Skill, High-Growth Jobs List, “Career Choice” Ticket (Blackline Master C4), chart paper or chalk board, markers or chalk, blank paper for small groups to record answers, island decorations or other thematic add-ins as desired

Vocabulary or Concepts
(New and/or Challenging)

- Labor Market Information
- Tsunami



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CAREER EXPLORATION TICKET LAST 1 Current Career Choice Why? 2 High-Skill, High-Growth Career Choice Why? Training Required	CAREER EXPLORATION TICKET FIRST Current Career Choice Why? High-Skill, High-Growth Career Choice Why? Training Required	CAREER EXPLORATION TICKET LAST 1 Current Career Choice Why? 2 High-Skill, High-Growth Career Choice Why? Training Required	CAREER EXPLORATION TICKET FIRST Current Career Choice Why? High-Skill, High-Growth Career Choice Why? Training Required
CAREER EXPLORATION TICKET LAST 1 Current Career Choice Why? 2 High-Skill, High-Growth Career Choice Why? Training Required	CAREER EXPLORATION TICKET FIRST Current Career Choice Why? High-Skill, High-Growth Career Choice Why? Training Required	CAREER EXPLORATION TICKET LAST 1 Current Career Choice Why? 2 High-Skill, High-Growth Career Choice Why? Training Required	CAREER EXPLORATION TICKET FIRST Current Career Choice Why? High-Skill, High-Growth Career Choice Why? Training Required
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NETWORKING BINGO

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3.c	<p>4. The student evaluates skills for personal success. The student is expected to: (B) use interpersonal skills to facilitate effective teamwork.</p> <p>7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills.</p>

Instructional Directions This activity is designed to take 30–45 minutes as presented below.

- Using **Blackline Master C5**, complete the activity by having students fill out their responses to each of the prompt boxes with their individual answers first. Allow a limited amount of time based on how you would like to implement the lesson. This can be a quick ice breaker to begin the thought process on interests and education and career decision making, or it can serve as a larger lesson to include a group discussion. For either, allow no more than 2–3 minutes for the individual work.
- Next, explain to students that they will be networking. This is also briefly defined in line item 3 on the worksheet. Networking is talking to people to discover and share mutual interests. Role-playing this activity might be valuable at this point.
- Inform students that they will have 8–12 minutes (again, based on the customization of your lesson) to network. The first student to find 12 unique connections with other students to complete their grid should shout “Bingo!” At this point, the interactions should stop and the teacher should verify the connections by calling out the answers (i.e. “Johnny, Alice said you both share the same Ideal Job as an Astronaut.”) If all the answers are verified, that student “wins.”
- The activity should end with discussion on the purpose of connecting with others through networking. It also sets up a brief assessment of interests and allows students to take an inventory of things in their lives that they may not have previously considered valuable in their career decisions. Some possible questions for discussion are included at the bottom of the worksheet.

Learning Outcome(s) Students will apply interpersonal skills to recognize similarities in interests and both education and career decisions with their peers.

Deliverables Completed Blackline Master C5

Resources Needed Blackline Master C5

Vocabulary or Concepts (New and/or Challenging)

- Networking
- Interpersonal

MODIFICATIONS & EXTENSIONS

- **Extensions:** Provide Workforce Solutions' High-Skill, High-Growth Jobs List (wrksolutions.com/jobs/doc/WFS-HSHG.pdf) and Focus On Profiles (wrksolutions.com/jobs/focuson.html) to give students the opportunity to research possible occupations before they network.
- **Simplify:** For smaller classes and groups, the lesson can be adapted to allow students to have one student's name more than once. However, the focus should be on communicating with as many people as possible so the number of interactions per student should be controlled.



Name _____

Period _____

Date _____

NETWORKING BINGO

INDIVIDUALLY

1. Respond to each prompt (as it pertains to your own life and experience) by writing your answer on the “Me” line in each box.
2. You have _____ minutes to complete this portion of the exercise.

IN A GROUP

3. Stand up, walk around, and talk to people. This is called “networking.” Identify individuals that have the same response for each box. When you find someone that matches your response, write their name in the box. You may not have the same person’s name more than ONE time in the grid.
4. You have _____ minutes to network and complete your grid. Yell “BINGO!” when all blanks are filled in.

<p>SHOE SIZE</p> <p>Me: _____</p> <p>Name: _____</p>	<p>INTENDED COLLEGE MAJOR</p> <p>Me: _____</p> <p>Name: _____</p>	<p>FAVORITE ANIMAL</p> <p>Me: _____</p> <p>Name: _____</p>	<p>STRONGEST SKILL</p> <p>Me: _____</p> <p>Name: _____</p>
<p>YOUR IDEAL CAREER</p> <p>Me: _____</p> <p>Name: _____</p>	<p>BIGGEST FEAR</p> <p>Me: _____</p> <p>Name: _____</p>	<p>HOMETOWN</p> <p>Me: _____</p> <p>Name: _____</p>	<p>FAVORITE STORE</p> <p>Me: _____</p> <p>Name: _____</p>
<p>FAVORITE COLOR</p> <p>Me: _____</p> <p>Name: _____</p>	<p>INDUSTRY IN WHICH YOU WOULD LIKE TO WORK</p> <p>Me: _____</p> <p>Name: _____</p>	<p>FAVORITE HOBBY</p> <p>Me: _____</p> <p>Name: _____</p>	<p>COLLEGE/UNIVERSITY YOU WANT TO ATTEND</p> <p>Me: _____</p> <p>Name: _____</p>

1. How could people who share your interests help you make good educational and career choices?
2. Who would be the most beneficial connection on your grid? Why?
3. How might a “fun” connection like “favorite hobby” or “animal” help in your career development?
4. Can social media, like Instagram or Snapchat, help us network? If so, how? Can it hurt our networking opportunities?

