STEM Experience

SURVIVOR

ADP MaST Academy

CANUTILLO HIGH SCHOOL

Survivor Summer Camp Week 1

	Monday		Tueday		Wednesday		Thursday		Friday
8:30-8:45	Interactive Notebook Intro. [20 min.]	Liz/Ale	Blanket Name Game [30 min.]	Sal	Juggling Balloons (Team-Builder) [30 min.]	Ale Liz	Personal Space Game (Team-Builder) [30 min.]	Monica	Heuco Tacks Field Trip
8:45-9:00	Introduction and Camp Rules [1 hr.]	Nick							
9:00-9:15			Biome Foldable (Temeperate Forest) [1 hr.]	Nohemy	Knots [2 hr. 30 min.]	Isaac Troy	New Biome (Desert) [30 min.]	Ale Liz	
9:15-9:30	Animal Name Game (Team-Builder) [30 min.]	Nick							
9:30-9:45							Fire?? [45 min.]	Sal Liz	
9:45-10:00	Plane Crash Activity [40 min.]	Nohemy							
10:00-10:15			Blindfold Snake Game (Team-Builder) [45 min.]	Nick Nohemy					
10:15-10:30							PVC Race (Team-Builder) [45 min.]	Isaac Nick	
10:30-10:45	Area Concepts [1 hr.]	Monica							
10:45-11:00			#Penny Challenge [45 min.]	Nick Monica					
11:00-11:15							Introducting Accel. [30 min.]	Nick Nohemy	
11:15-11:30									
11:30-11:45	Lunch								
11:45-12:00									
12:00-12:15	Tour of Campus [30 min.]	Everyone	Fence & Box Problem [2 hr. 45 min.]	Isaac Sal	Similar Triangles [1 hr.]	Sal	Mouse Trap Lesson [2 hr. 45 min.]	Nick Nohemy	
12:15-12:30									
12:30-12:45	Create: Scale Factor [30 min.]	Liz Ale							
12:45-1:00									
1:00-1:15	Concepts of Maps [1 hr. 45 min.]	Isaac			Astrolabe [1 hr. 45 min.]	Monica			
1:15-1:30									
1:30-1:45									
1:45-2:00									
2:00-2:15									
2:15-2:30									
2:30-2:45									
2:45-3:00	Journal [15 min.]	Liz	Journal [15 min.]	Liz	Journal [15 min.]	Liz	Journal [15 min.]	Liz	

Survivor Summer Camp Week 2

	Monday		Tueday		Wednesday		Thursday		Friday
8:30-8:45	Linking Arms (Team-Builder) [30 min.]	Ale	Biome Foldable (Grassland) [1 hr.]	Ale	Biome Foldable (Fresh Water) [1 hr.]	Troy	Marble, Oreo & Plates (Team-Builder) [30 min.]	Ale Liz	UTEP Field Trip
8:45-9:00									
9:00-9:15	Draw what they think is in a Turndra [1 hr.]	Liz					Linear Function [45 min.]	Nohemy	
9:15-9:30									
9:30-9:45			Trash Bag (Team-Builder) [30 min.]	Monica	Penny Drop (Water Refraction) [45 min.]	Monica			
9:45-10:00							Quadratics and Transformations [1 hr.]	Ale	
10:00-10:15	Teambuilder Favorite (Team-Builder) [30 min.]	Troy	Building Hot Air Balloon [1 hr. 30 min.]	Ale Troy					
10:15-10:30					Lazer Maze (Team-Builder) [30 min.]	Sal Troy			
10:30-10:45	Climate Change & Effects to Tundra [1 hr.]	Isaac							
10:45-11:00							Potential & Kinetic Energy [45 min.]	Isaac Monica	
11:00-11:15									
11:15-11:30									
11:30-11:45	**Lunch**								
11:45-12:00									
12:00-12:15	Probability [1 hr.]	Nohemy Sal	Test Hot Air Balloon [30 min.]	Ale Troy	Introduce Catapult, Quadratics [30 min]	Ale Liz	Dice/Noodle (Team-Builder) [30 min.]	Monica Troy	
12:15-12:30									
12:30-12:45			Juggling Balloons (Team-Builder) [30 min.]	Isaac Nick	Catapult, Plotting & Gallery Walk [2 hr. 15 min.]	Nick Sal	Roller Coasters [2 hr. 15 min.]	Nick Sal	
12:45-1:00									
1:00-1:15	Population Growth [1 hr.]	Ale	Star Navigation [1 hr. 45 min.]	Monica Nohemy Sal Troy					
1:15-1:30									
1:30-1:45									
1:45-2:00									
2:00-2:15	Mice Recap [15 min.]	Monica/Troy							
2:15-2:30	Guess Who? (Team-Buildeer) [30 min.]	Ale							
2:30-2:45									
2:45-3:00	Journal [15 min.]	Liz	Journal [15 min.]	Liz	Journal [15 min.]	Liz	Journal [15 min.]	Liz	

Lesson Plans 1

Topic: Day 2-Temperate Forest Biome 9-10 am

<table>
<tr><td colspan="2">TEKS Science Concepts 7.12
The student knows that there is a relationship between organisms and their environment. The student is expected to:
(C) describe how different environments support different varieties of organisms.</td></tr>
<tr><td colspan="2">My learning objective:
Through self-discovery, we will learn about the animals, plants and weather the temperate forest is made up of.</td></tr>
<tr><td>Teaching strategies that will make this activity fun and exciting.

Through self-discovery we will learn about the temperate forest biome while completing a crossword puzzle.</td><td>Materials:

-Crossword puzzle
-Electronic device that connect to internet
-Pencil
-Foldable
-Mouse template paper
-Colored pencils</td></tr>
<tr><td colspan="2">Activity 1: Fill out crossword puzzle by looking up the description on an electronic device
Duration: 30 minutes</td></tr>
<tr><td colspan="2">Activity 2: As a class, review the crossword puzzle and complete the biome foldable
Duration: 15 minutes

Foldable will include animals, plants, weather found in the biome and adaptations that will occur due to the biome.</td></tr>
<tr><td colspan="2">Activity 3: Through a mouse, we will learn about the different adaptations animals may go through in this biome.
Duration: 15 minutes</td></tr>
</table>

http://temperaterainforestelynam.weebly.com/index.html

Lesson Plans 1

Topic: Tangent introduction and Clinometer Building

TEKS: TEKS:
Geometry 9A: determine the lengths of sides and measures of angles in a right triangle by applying the trigonometric ratios sine, cosine, and tangent to solve problems

My learning objective:
Understand the difference between angle of elevation and depression
Introduce to students cosine, sine, and tangent and apply the rules.

Teaching strategies that will make this activity fun and exciting.

- Building a clinometer
- Going over trig ratios with a foldable
- Watching *Gettin' Triggy wit It* by WSHS
- Little competition
- 10 Stations with an end word

Have stations so that students solve a couple of problems involving distance formula and surface area.

Materials:

- Clinometer template (paper)
- Some sticky tape.
- Straws.
- Some thread.
- Blu-tack or modelling clay
- Poster board
- Hook and loop tape

Activity 1: Building the clinometer Duration: 20 min

Show students what is angle of depression and angle of elevation

Definition of

Angle of Elevation

The "upwards" angle from the horizontal to a line of sight from the observer to some point of interest.

If the angle goes "downwards" it is called an Angle of Depression.

To introduce the importance of tangent, students will build their own clinometer and find angles from the accompanying activity.

Lesson Plans 1

http://mrscienceut.net/Making%20and%20Using%20an%20Astrolabe.pdf (Instructions for astrolabe and activity)

Activity 2: Trigonometry Ratio Foldable & Competition Duration: 30 min.

We will work on foldable and then have students compete in a game where they have to recall the trig ratios and put it in a poster board. Groups will compete against one another. Afterwards we will watch a 4 minute video about trigonometry.

https://www.youtube.com/watch?v=t2uPYYLH4Zo (video)

Activity 3: Solving 10 angle of depression/elevation station. Duration: 55 min.

Using 10 stations, students will solve 10 problems. Perhaps do it in a video game format. (In Legend of Zelda when a puzzle is solved, a noise is played.) Or perhaps they can go throughout classrooms when they solve a problem.

http://noproblo.dayjo.org/ZeldaSounds/QuickSearch.php?q=secret (Legend of Zelda sound effects)

Name _____

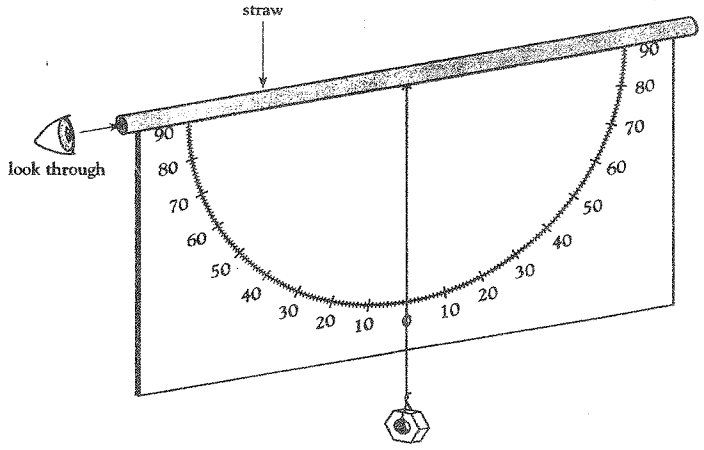
Making an Astrolabe

Ancient astronomers used astrolabes to measure the movement of the sun, moon, planets, and stars through the heavens. You can use an astrolabe to estimate the height of very tall objects or your own kite as it flies.

You need these materials:

- copy of the astrolabe gauge
- tape
- a straw
- 12" of string
- a weight (such as a nut, washer, or heavy paper clip)
- a piece of cardboard or oaktag approximately 8" by $5\frac{1}{2}$"

Use the picture to help guide your work.
Put a check in each box as you complete the step.



☐ Cut out the gauge.

☐ Glue the gauge along the top edge of your cardboard.

☐ Make a $\frac{1}{8}$" notch at the arrow in the center top edge of the gauge and fit one end of the string in it. Bring one inch of the string to the back of the astrolabe and tape it down well.

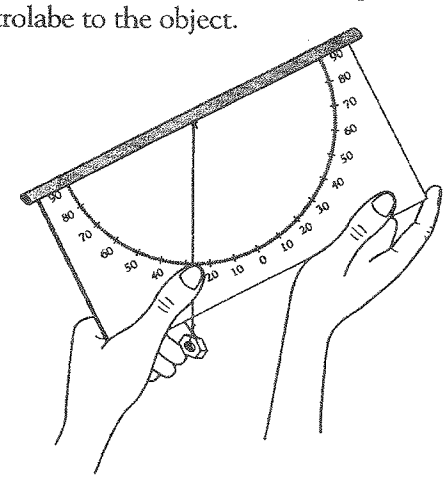
☐ Tie the weight to the long end of the string. This will hang free down the front side of the astrolabe.

☐ Tape the straw along the top of the astrolabe.

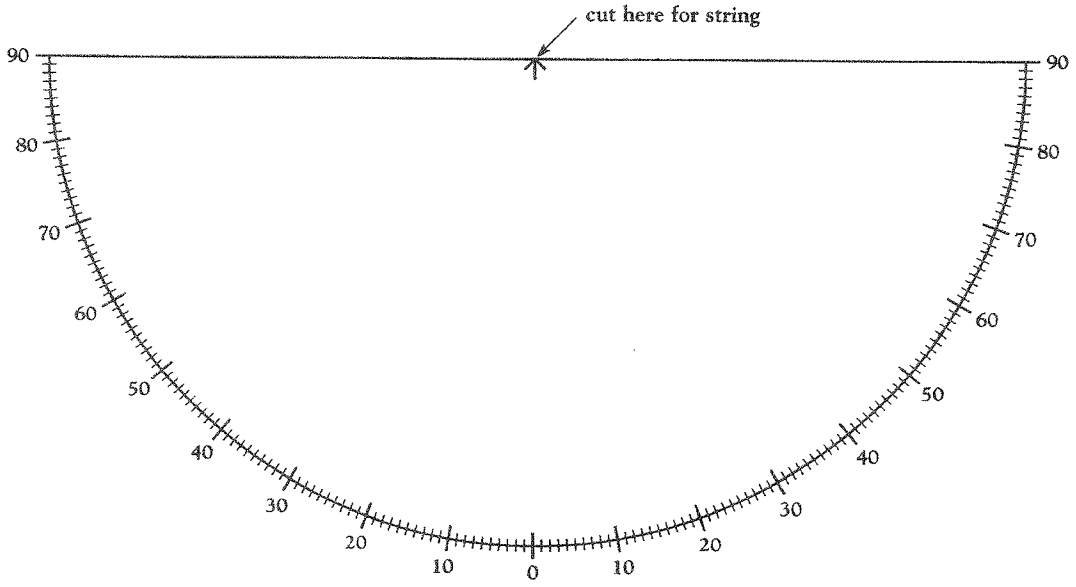
☐ Write your name on the back.

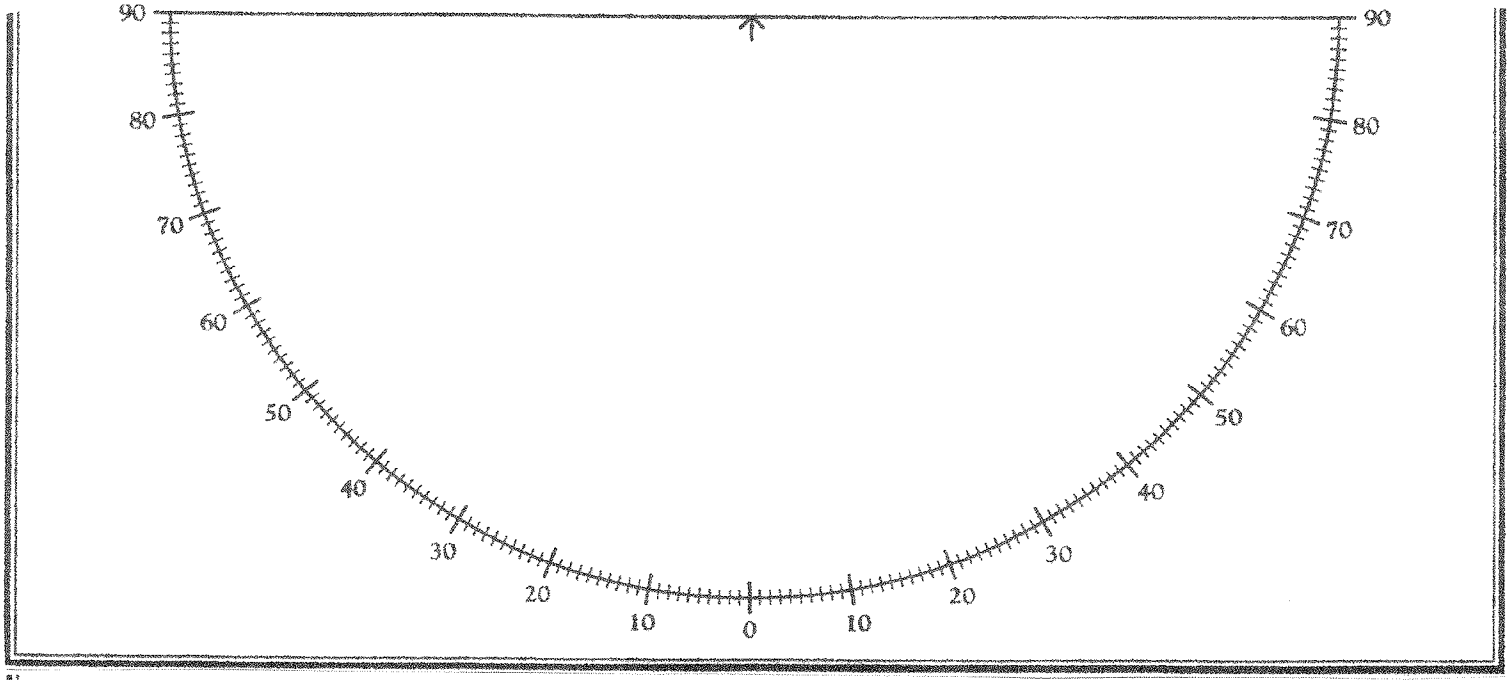
To use your astrolabe, look at the object through the straw, the sight, letting the string hang loose. When the object is in middle of the sight, hold the string tightly against the gauge.

Still holding the string against the astrolabe, bring it down so that you can read where the string is on the gauge. This is the number of degrees in the angle formed by the level ground and the line from your astrolabe to the object.



Practice taking readings of tall objects. Record you readings. Compare your readings to those of your classmates.

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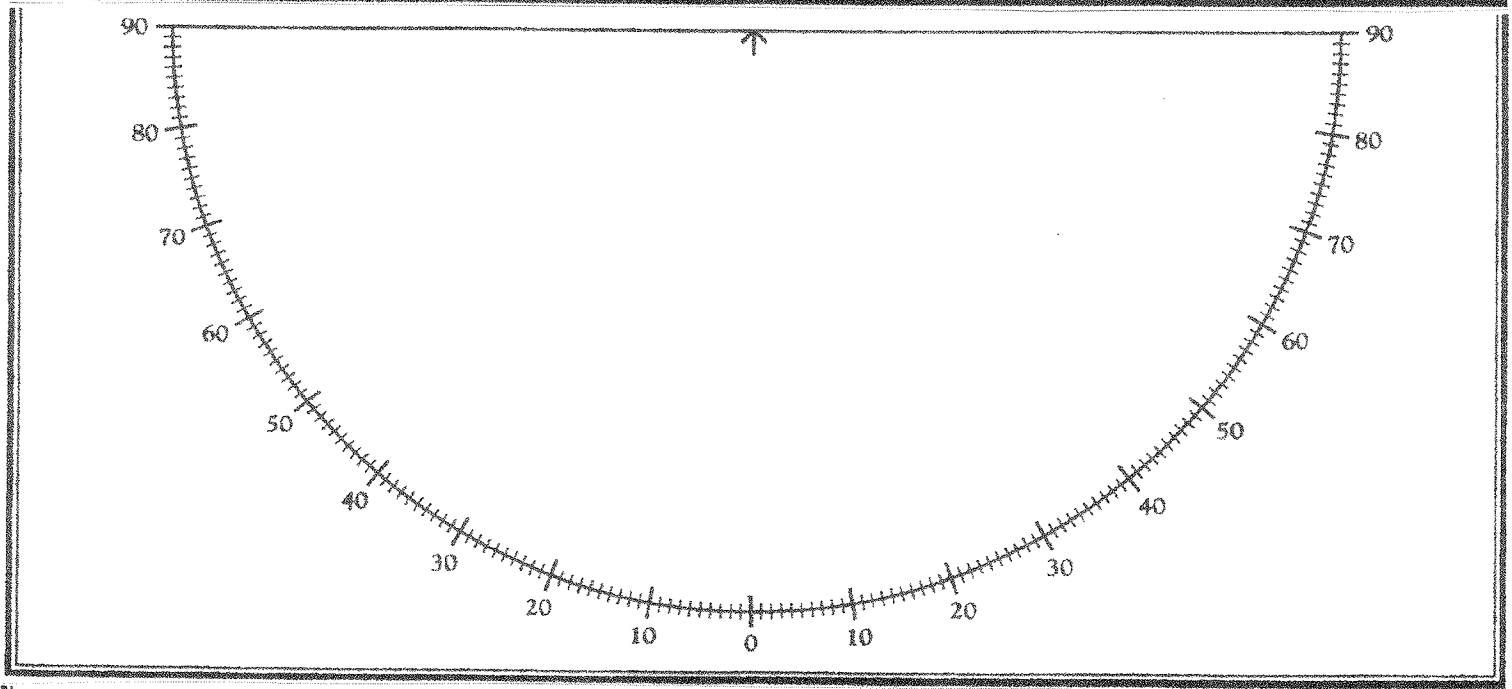
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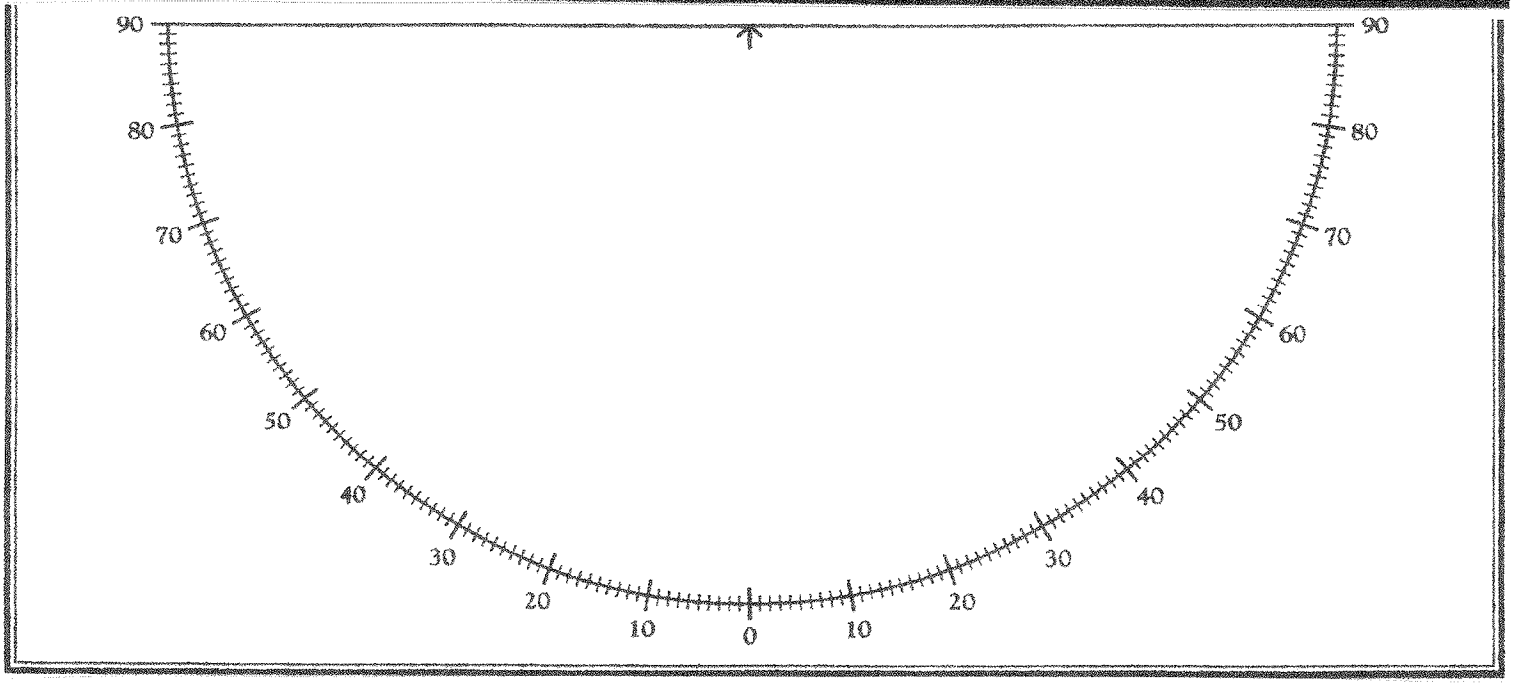
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Lesson Plans 1

Topic: Mouse Trap Cars / Blow Car

TEKS: A.9(C) write exponential functions in the form f(x) = abx(where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

My learning objective:
To have students understand the term of slope as a rate of change. This will help build the conceptual understanding of what's happening when they start to look at linear equations.

Teaching strategies that will make this activity fun and exiting.
We will be building a mouse trap car and measuring its distance over time, we will incorporate groups so that the students can have a better building experience.

Groups of two

Materials:

-1 mousetrap
-small rubber bands (#32, 3x1/8in.,7.62x0.32cm)
-cotton threat
-4 eyehook screws, 25/64" x1-1/2"
-4 CD disks
-2 wooden dowels, 5/16 inch x 36
-hot glue gun
-mini size hot glue sticks (4in. x .27in.,101mmx6.8mm)

Activity 1:
Build the mouse trap cars

http://www.capstonekids.com/make-stuff/downloads/Capstone_Project_Car.pdf

Duration: 1hour

Activity 2:
Plotting the cars time over distance. We will have a track laid out with marks .25 m apart all the way up to 1.5 m this will allow students to plot points and see the first half of a quadratic curve.
Duration: 1hr

Build time | 2 to 2 ½ hours

Mousetrap Car

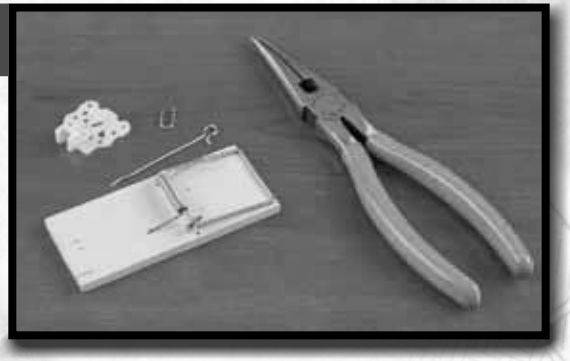
Mousetraps can have more uses than just catching mice. Put the power of a mousetrap to work to make this car run. Be careful not to snap your fingers!

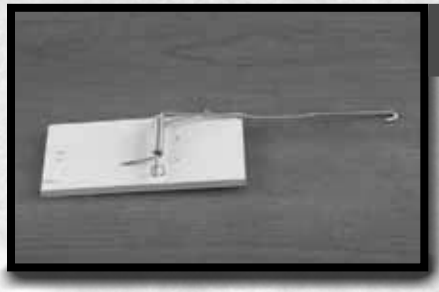
MATERIALS

- 1 mousetrap
- small rubber bands
- heavy string
- 4 eyehook screws, 1 ⅛ inches (2.9 cm) long
- 4 large washers, 2 inches (5 cm) wide
- 2 wooden dowels, 3/16 inch (.5 cm) thick by 3 inches (7.6 cm) long

1

Use pliers to remove the metal parts of the mousetrap, but leave the spring and lever.



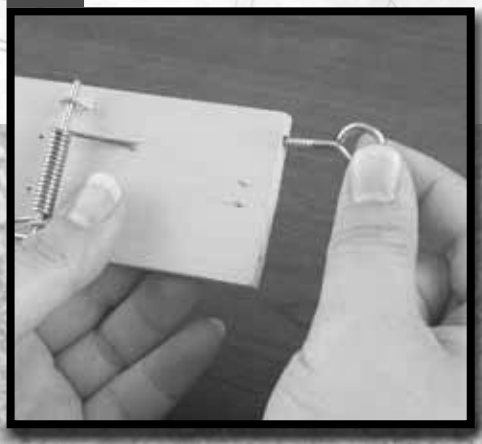


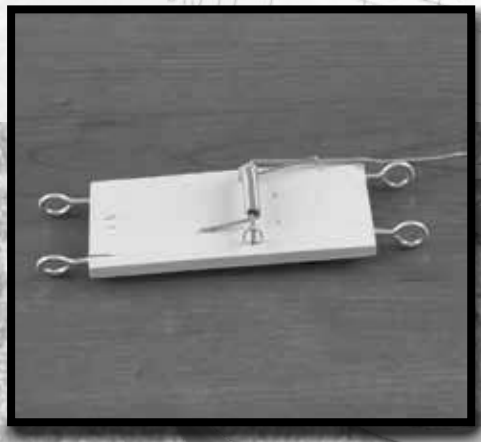
2

Remove the hooked end of the lever from the spring. Straighten out the wire, but leave the hook in the end. Position the lever so it points straight back behind the trap.

Ask an adult to help you drill four small holes about ¼ inch (.64 cm) from each corner of the mousetrap. Screw one eyehook into each hole. Be sure not to split the wood.

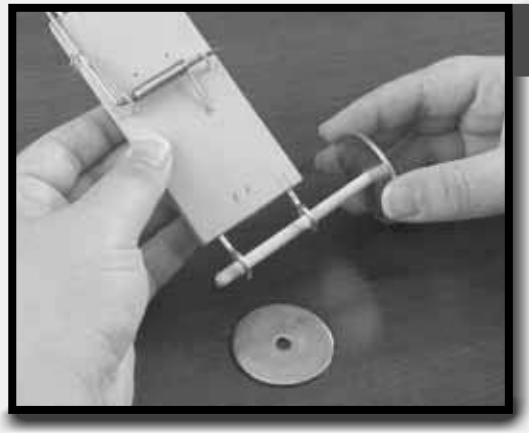
3





4

Place the end of one dowel into a washer. Ask an adult to help glue the washer in place with hot glue. Repeat this step with the second dowel.

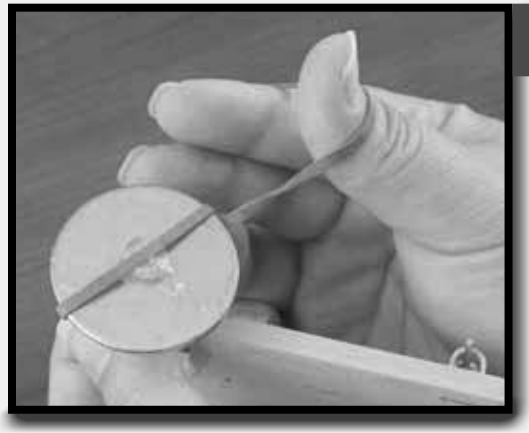


5

Slide the dowels through the eyehooks to form the car axles. Then repeat step 4 on the other ends of the dowels.

6

Cut a piece of string about 12 inches (30 cm) long. Tie one end to the hook on the lever. Tie the other end to the back axle. Use hot glue to hold the tied ends in place.

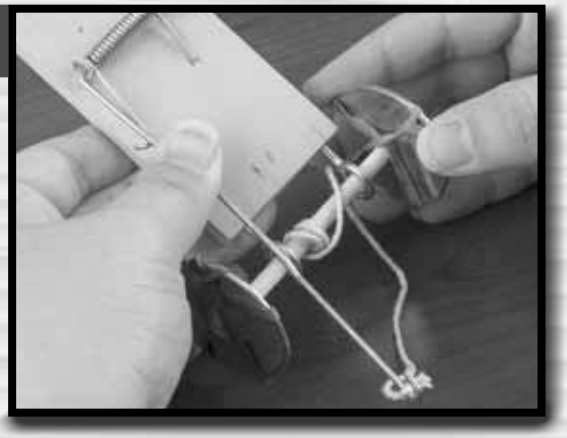


7

Wrap 2 or 3 rubber bands around each back wheel. The rubber bands will provide traction for the car.

8

Carefully lift the lever while winding the string counterclockwise onto the back axle.



TIP

Mousetrap springs are very powerful. Be sure to hold the lever tightly while building and playing with this car.

9

When the string is wound tight, it's time to launch the car. Hold the lever in place and carefully set the car on the floor. Release the lever and watch your car take off!

Lesson Plans 1

Topic: ___**Biome Desert**_____

TEKS:
7.10 b) The student is expected to describe how biodiversity contributes to the sustainability of an ecosystem

My learning objective:
The student will know what to find in the given biome such as plants, animals, and the environment.

Teaching strategies that will make this activity fun and exciting.	Materials:
Brain Breaks Foldable Cooperative Learning (Explanation of biomes http://www.ucmp.berkeley.edu/exhibits/biomes/deserts.php)	Colored Pencils Markers Computer Projector Paper Pencil

Activity 1: Duration: 15 min

How did we end up in a Desert in the same island as a Temperate Forest?

Rain Shadow: a region having little rainfall because it is sheltered from prevailing rain-bearing winds by a range of hills

The mountain gets in the way of the cloud so the rain falls only on one side of the mountain.

https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwiGtoLpy6DUAhVaVWMKHcrQCyIQjRwIBw&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FRain_shadow&psig=AFQjCNGih-zqMismNLi-8bv785g5K-VkbA&ust=1496542070774962

Group discussion of, what would you find in the desert?

Do we have plants?

How do they get water?

What types of animals are there?

How do they survive?

Is there water in the desert?

Video; https://www.youtube.com/watch?v=nw77OcWIOmM

During video they will write down unknown words to be discussed afterwards and any plants and/or animals mentioned in the video.

Discuss vocabulary

Activity 2: Duration: 15 min

Put them in groups of 2

Complete their foldable for the Desert section

Vocabulary for Desert Biome:

Desert: a landscape or region that receives an extremely low amount of precipitation

Adaptations: make suitable for a new use or purpose; modify

Mammals: a warm-blooded vertebrate animal of a class that is distinguished by the possession of hair or fur, the secretion of milk by females for the nourishment of the young, and (typically) the birth of live young.

Reptile: a vertebrate animal of a class that includes snakes, lizards, crocodiles, turtles, and tortoises. They are distinguished by having a dry scaly skin and typically laying soft-shelled eggs on land.

Species: a group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding. The species is the principal natural taxonomic unit, ranking below a genus and denoted by a Latin binomial, e.g., Homo sapiens.

Climate:

Less than 10 inches per year

Plants:

Cactus

Agave

Perennial plant

Rosette

Yucca

Animals:

Camel

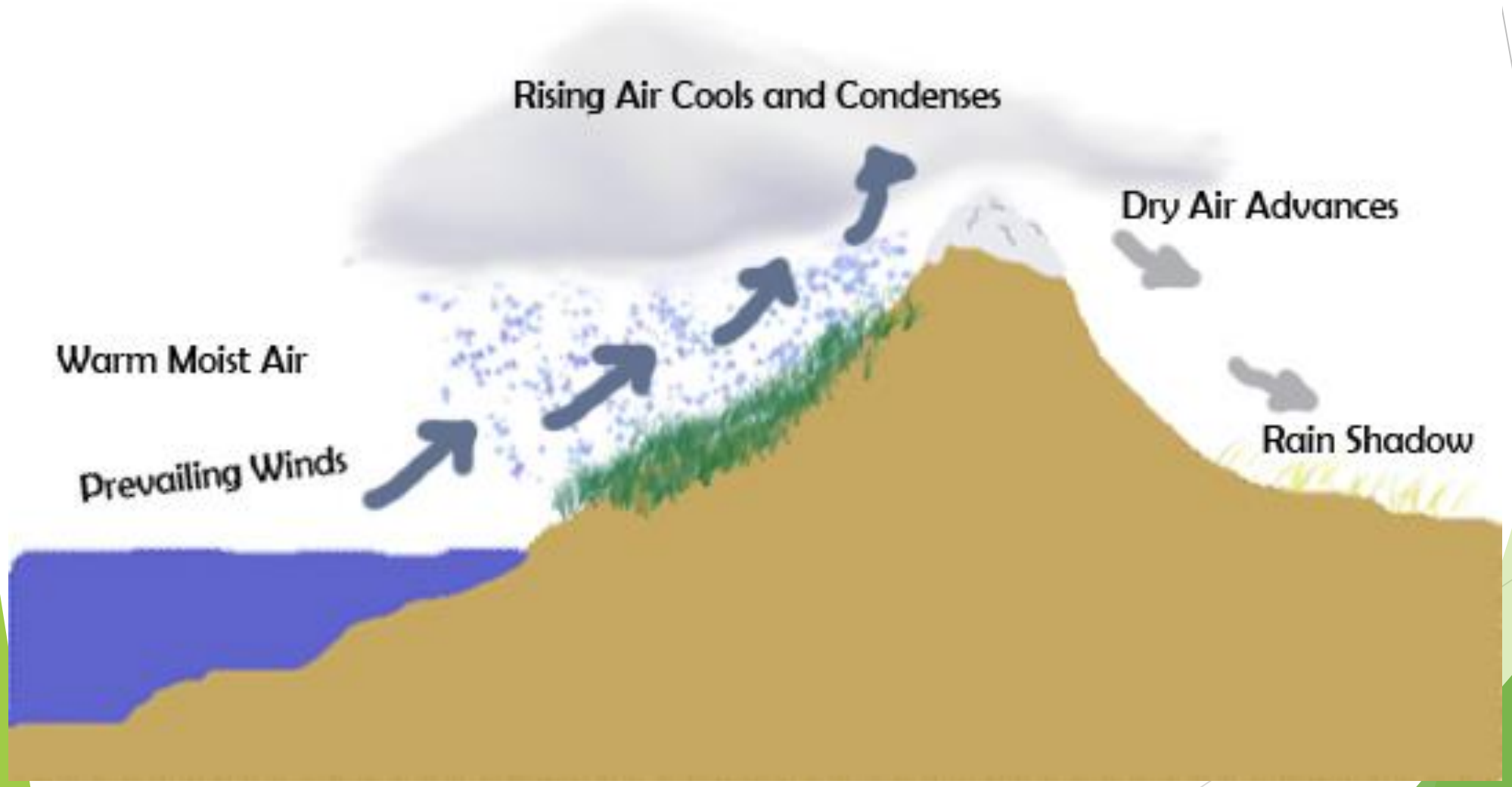
Roadrunner

Kangaroo mice

Jackrabbit

Hot and Dry Desert

Rain shadow


Rising Air Cools and Condenses
Dry Air Advances
Warm Moist Air
Rain Shadow
Prevailing Winds

Where does Rain shadow happen?

- HERE in El Paso!
- Ex. When it is hailing in

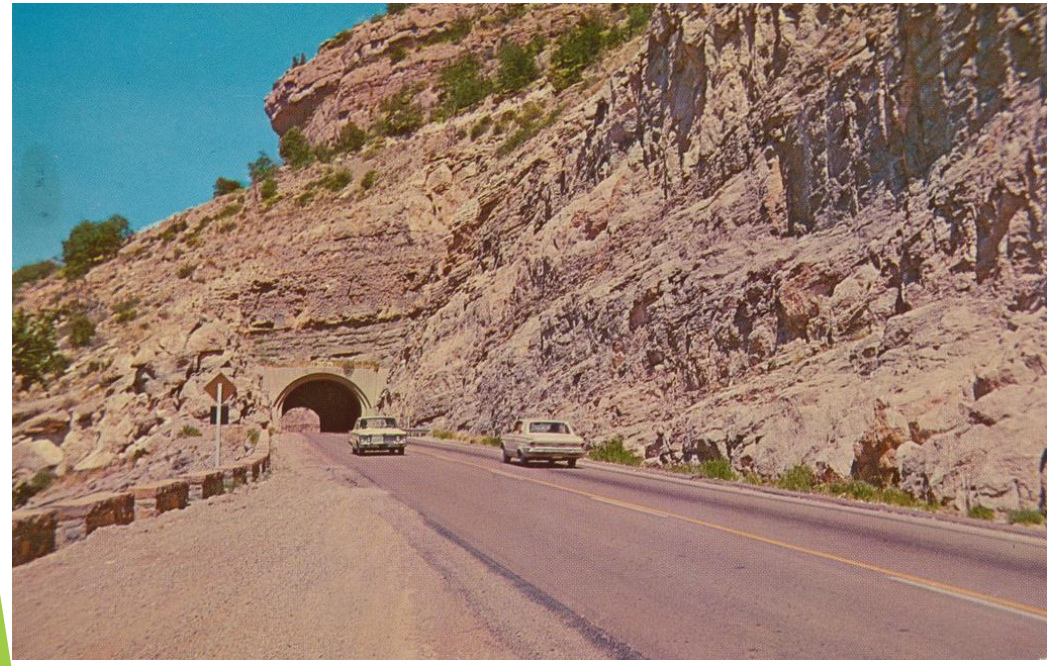
The East side and

Completely sunny in the

West side!

Other examples:

- Cloudcroft, New Mexico by Ruidoso



- It’s like a portal!

Edible Plants

Typical barrel cactus (Ferocactus and Echinocactus) fruit

Stinging nettle steamed or sautéed has a delicious taste

Lesson Plans 1

Topic: **Biome Tundra**

TEKS: 7.10 b) The student is expected to describe how biodiversity contributes to the sustainability of an ecosystem	
My learning objective: The student will know what to find in the given biome such as plants, animals, and the environment.	
Teaching strategies that will make this activity fun and exciting. Kinesthetic Activity (Gallery Walk) Creative activity (drawing)	Materials: Paper Markers Color pencils Pencil Tape Candy
Activity 1: Duration: 30 min In pairs: Draw what you think you'll find in the Tundra Biome? (Parameters) 2 animals, 3 plants, and mouse, include expected climate. Once you finish, tape your drawing to the wall wait for others to finish Walk around the classroom and look at other's pictures. The last picture will be the one that is the reality of what really is in the Tundra. Person with "best picture" or "most accurate picture" will receive candy	
Activity 2: Duration: 30 min Discuss Tundra Biome Fill in foldable	

Lesson Plans 1

Topic: **Exponential Functions; Growth and Decay**

TEKS:
A1: 9 d): The student is expected to graph exponential functions that model growth and decay in mathematical and real world problems

My learning objective:
The student will be able identify growth and decay using exponential functions.

Teaching strategies that will make this activity fun and exciting.	**Materials:**
M&M and Skittle project Graphing Group Work Discussion Read	M&M's Skittles Laminated graph paper Pencil Paper Book Expo markers

Activity 1: **Duration: 1 hr**
Read the book that explains exponential growth and decay
Put them in groups of 3
Brain Break
Explain M&M and Skittle Project (population of people/mice)
Begin working on project

Activity 2: **Duration: 30 min**
Graph points
Discuss graphs

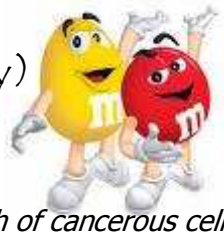
Team builder 1:

Description:

How does this connect to your activity?

Name_____ Partners _____ _____

M&M Lab (Exponential Growth and Decay)



Part I: Modeling Exponential Growth M&M Activity

The purpose of this lab is to provide a simple model to illustrate exponential growth of cancerous cells.

In our experiment, an M&M represents a cancerous cell. If the M&M lands "M" up, the cell divides into the "parent" cell and "daughter" cell. The cancerous cells divide like this uncontrollably-without end.

*We will conduct **15 trials** and record the number of "cancerous cells" on the plate.*

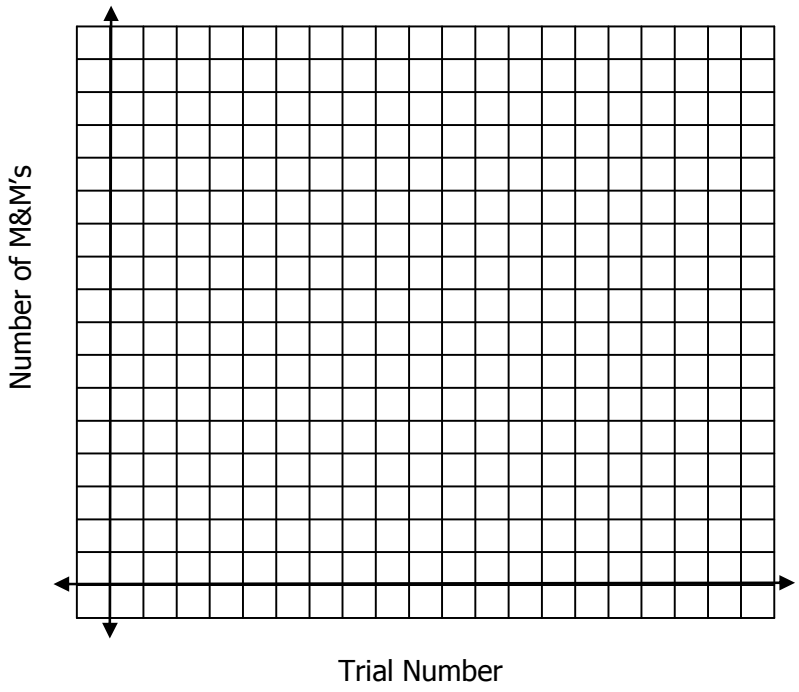
DO NOT EAT THE M&M's UNTIL YOU ARE DONE COLLECTING ALL DATA

Exponential Growth Procedure

1) Place 2 M&M's in a cup/plate. This is trial number 0.
2) Shake the cup and dump out the M&Ms. For every M&M with the "M" showing, add another M&M and then record the new population. (Ex. If 5 M&Ms land face up, then you add 5 more M&Ms)
3) Repeat step number 2 until you are done with 15 trials OR you run out of M&Ms.

Trial #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
# of M&M's *(# of cells)*	2															

4) Graph your data (scatterplot) with the trial number on the x-axis and the number of M&M's on the y-axis.



Exponential Growth Discussion

5) Should your graph touch the x-axis? Why or why not?

6) After each time you shook the cup, *approximate* the percentage of M&M's that landed with the imprint of "M" face up by looking at your table. _____

To *calculate* the percentage, we will calculate the percent change for *each* trial using the formula below.

$$\frac{\#M\&M's\ in\ Phase1 - \#M\&M's\ in\ Phase0}{\#M\&M's\ in\ Phase\ 0} = \frac{new\ amount - old\ amount}{old\ amount}$$

Complete the table below.

Trial #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Percent ***(write as decimal)***	X															

Calculate the average of *ALL* the percents: _____

7) We can write an exponential growth function that models the data above using the formula $\mathbf{y = C\,(1+r)^t}$

Initial amount of M&M's (# of M&Ms you started with) C = _____

Rate of growth (calculated average from #6) r = _____ (written as a decimal)

Time (this represents a specific phase number) t = # of repetitions

Fill in the variables to write your own exponential growth equation:

8) We can also use a graphing calculator to write the exponential growth equation.

You will need to enter your data table from page 1 into your graphing calculator.
Click STAT, and under EDIT choose Edit. A blank table should appear. Under L_1 you are going to list the trial number and under L_2 list the Number of M&Ms.
(ONLY IF YOUR ALREADY HAVE DATA IN THE LISTS: To clear the lists before you begin, highlight the list name all the way at the top and press CLEAR—not delete—and ENTER.)
Now you need to find the "curve of best fit". This will make an equation that *best models* your data. Go to your home screen (2^{nd} QUIT), click STAT, scroll right to CALC, select ExpReg, press ENTER.
Write the exponential regression equation to three decimal places.

$$y = \underset{a}{\_\_\_\_\_} * \left(\underset{b}{\_\_\_\_\_}\right)^x$$

9) Use your exponential growth model that you created in #7 to predict the number of "cancerous cells" there would be in:

Trial 25 _____ Trial 50 _____

Now, use your exponential growth model that you created in #8 to predict the number of "cancerous cells" there would be in:

Trial 25 _____ Trial 50 _____

Explain any differences.

Part II: Modeling Exponential Decay

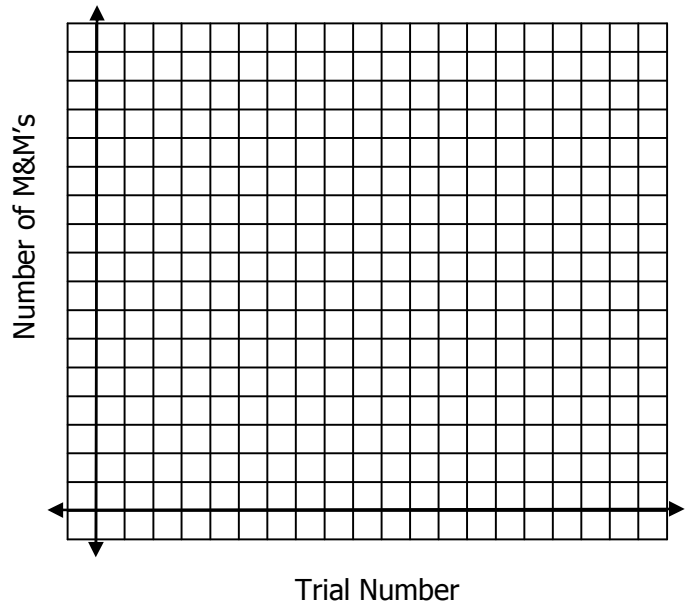
10) Count the total number of M&Ms that you have. Record this number in trial # 0.

11) This time when you shake the cup and dump out the M&Ms, remove the M&Ms with the "M" showing. Record the M&M population.

12) Continue this process and fill in the table. You are done when you have completed 10 phases –OR- when your M&M population gets below 4. **Do NOT record 0 as the population!!!**

Trial #	0	1	2	3	4	5	6	7	8	9	10
M&M Population											

13) Sketch the graph representing your data.



Exponential Decay Discussion

14) In the instructions for #14 (in Part II), why do you think you are NOT supposed to reduce the number of M&Ms all the way to zero? Explain.

15) Using your calculator again, write the exponential regression equation to three decimal places (see step #8 in part I)

$$y = \underset{a}{\_\_\_\_\_} * \left(\underset{b}{\_\_\_\_\_}\right)^x$$

16) Use the exponential decay model you found in #16 to determine your M&M population on the 4th Phase? How does this "theoretical" number compare to your actual data for the 4th phase. Are they the same? Are they similar? What are some reasons why your results are different? Explain.

Part III: Lab Discussion

Look at the exponential regression equations from your calculator … These questions will help you to determine how well your exponential equation fits your actual data

1. In Part I, what was the "a" value? _____ In Part II, what was the "a" value? _____

   Why were the "a" values different in Parts I and II? _____

   _____

   What does the "a" value represent in the equation $y = a * b^x$? BE SPECIFIC. _____

   _____

2. In Part I, what was the "b" value? _____ In Part II, what was the "b" value? _____

   Why were the "b" values different in Parts I and II? _____

   _____

   What does the "b" value represent in the equation $y = a * b^x$? BE SPECIFIC. _____

   _____

3. In the instructions for Part II (decay) why do you think you are NOT supposed to reduce the number of M&Ms all the way to zero? Explain.

   _____

Lesson Plans 1

Topic: Day 6-Fishing game and Probability

TEKS: C.13
(13) Probability. The student uses the process skills to understand probability in real-world situations and how to apply independence and dependence of events. The student is expected to:

(A) develop strategies to use permutations and combinations to solve contextual problems;
(B) determine probabilities based on area to solve contextual problems;
(C) identify whether two events are independent and compute the probability of the two events occurring together with or without replacement;
(D) apply conditional probability in contextual problems; and
(E) apply independence in contextual problems.

My learning objective:
I will learn about probability by fishing colored gold fish.

Teaching strategies that will make this activity fun and exciting.	Materials:
Playing a fishing game with colored gold fish. We will discuss probability of a different event (colored fish) with replacement and without replacement.	-material box -colored gold fish -dixie cups -paper -pencil

Activity 1: Students will fish gold fish with dixie cups
Duration: 30 minutes

Activity 2: Students will then use the data they gained from fishing the colored gold fish and learn about probability with replacement and without replacement
Duration: 30 minutes

Lesson Plans 1

Topic: **Biome Grassland**

TEKS:
7.10 b) The student is expected to describe how biodiversity contributes to the sustainability of an ecosystem

My learning objective:
The student will know what to find in the given biome such as plants, animals, and the environment.

Teaching strategies that will make this activity fun and exciting.
Kinesthetic Activity
Group Work

Materials:
Animals found in biomes

Activity 1: **Duration: 40**
We will be doing a scavenger hunt to find things that are found in the grassland. We will challenge the students by adding other vegetation or animal life from other biomes.Students will receive a sheet that contains the number animals and plants they are searching for.

Activity 2: **Duration: 20**
Talk about activity 1
Put info in foldable

Team builder 1:

Description:

How does this connect to your activity?

PLANTS

- Buffalo grass
- Blue grama grass
- needle grass
- big blue stem
- switch grass

ANIMALS

- prairie dogs
- wolves
- turkeys
- eagles
- weasels
- bob cats
- foxes
- geese
- snakes
- mice
- rabbits

ADAPTATIONS

PLANTS:
- grow on base of plant to help survive fires
- deep roots left into ground to find moisture in the drought

Animals:
- Broad flat topped teeth
- digestive systems adapted to feed on grass
- birds nest underground (NO trees)
- camouflage
- burrowing behavior

MICE

"TROY"

Lesson Plans 1

Topic: Day 7-Star Navigation

<table>
<tr><td colspan="2">TEKS:
(5) Science concepts. The student develops a familiarity with the sky. The student is expected to:
C. recognize and identify constellations such as Ursa Major, Ursa Minor, Orion, Cassiopeia, and constellations of the zodiac</td></tr>
<tr><td colspan="2">My learning objective:
I will learn the names of the constellations and measure their angles.</td></tr>
<tr><td>Teaching strategies that will make this activity fun and exciting.

We will solve parametric equations with a TI calculator. We will learn about star navigation through 3 different stations.
Station 1: Igloo constellation
Station 2: Wave navigation/ constellation angle measurement navigation
Station 3: Crossword puzzle</td><td>Materials:
- TI 83/84/89 calculator
-parametric equations worksheet
-navigation with the stars (3 stations)
-constellation igloo</td></tr>
<tr><td colspan="2">Activity 1: Individually students will complete table of parametric equations(constellations) and describe what is occurring. As a group, they will choose their favorite parametric equation and draw it on paper. We will share with the class our favorite parametric equation(constellation)
Duration: 1 hour

Activity 2: The student will rotate between three stations learning about star navigation
Duration:1 hour and 30 minutes (30 minutes each station)</td></tr>
</table>

Lesson Plans 1

Topic: Water Refraction

TEKS:
Physics 7D: investigate behaviors of waves, including reflection, refraction, diffraction, interference, resonance, and the Doppler effect;

My learning objective:
Students will be able to understand the concept of light refraction and reflection

Teaching strategies that will make this activity fun and exciting.

- Having 4 different experiments going on.
- Watching a video about an experiment and the science behind it.

Materials:

- Vegetable oil
- Water
- Beakers and test tubes of different sizes
- Pencil
- Cup
- Index Cards
- Newspaper Clipping
- Coin
- Bowl
- Magnifying glass
- Plastic bags
- Glass bead

Activity 1: The *Disappearing Glass Trick* Duration: 10 min
https://www.youtube.com/watch?v=p-y5eZufMzg
https://www.youtube.com/watch?v=okWg6PLcnTM
https://www.youtube.com/watch?v=5bWm_KJC3q4&feature=youtu.be

Activity 2: The Light Refraction Stations Duration: 35 min.

There will be 4 stations:

- Bending Light
- Magnification
- Rising Coin
- Turning Arrow

Students will fill in their reflection sheets as they think about what is going on in each experiment.

Lesson Plans 1

Activity 3: Duration:

Lesson Plans 1

Topic: Day 8-Intorduction to Quadratics

TEKS:
(6) Quadratic functions and equations. The student applies the mathematical process standards when using properties of quadratic functions to write and represent in multiple ways, with and without technology, quadratic equations. The student is expected to:
(A) determine the domain and range of quadratic functions and represent the domain and range using inequalities;
(C) write quadratic functions when given real solutions and graphs of their related equations.

My learning objective:
We will learn the difference between a linear function and a quadratic function.

Teaching strategies that will make this activity fun and exciting.	Materials:
Comparing quadratics and linear functions. Finding their differences in domain and range.	-real world examples of quadratics

Activity 1:
Discuss the differences between linear and quadratic functions. We will explain the different domain and range for each.

Duration: 30 minutes

Lesson Plans 1

Topic: **Quadratic Functions**

TEKS:
A17c): The student is expected to determine the effects on the graph of the parent function f(x) = x^2 when f(x) is replaced by af(x), f(x)+d, f(x-c), for specific values of a, b, c, and d.

My learning objective:
Students will be able to do transformations for quadratic functions.

Teaching strategies that will make this activity fun and exciting.
Group Work
Kinesthetic Activity
Incentives

Materials:
Laminated Grids (20)
Expo Markers
Index cards (color coded)
Candy
Paper
Pencil

Activity 1: **Duration: 25 min**
Explain transformation formula
Students have to write down notes
Explain activity

Activity 2: **Duration: 1 hr.**
Students will be given tables, they will graph the ordered pairs on the laminated grids. They will do the transformation that is required at that station. Once they are done, the teacher will initial paper so that they can continue to the next station; whoever does the most transformations will receive a candy.

Team builder 1:

Description:

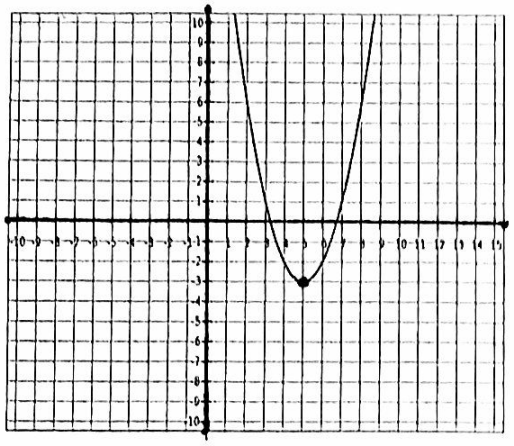
How does this connect to your activity?

Name_____ Date_____ Period_____

Transformations on Transformed Quadratic Functions

1. The graph of f(x) is shown below:

$$f(x) = (x-5)^2 - 3$$



a) Shift f(x) 8 units up

- New vertex: _____
- New function: _____

b) Shift f(x) 3 units to the left

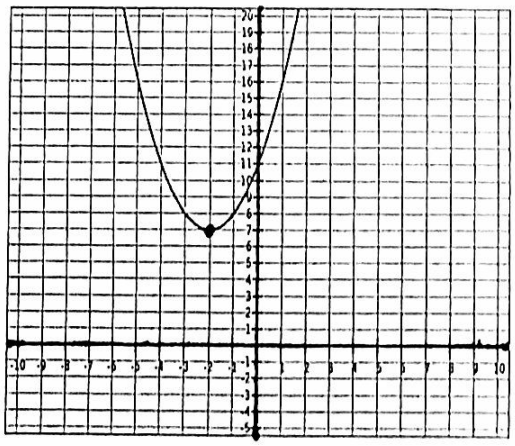
- New vertex: _____
- New function: _____

c) Shift f(x) 5 units up and 6 units to the left

- New vertex: _____
- New function: _____

2. The graph of g(x) is shown below:

$$g(x) = (x+2)^2 + 7$$



a) Shift f(x) 2 units down

- New vertex: _____
- New function: _____

b) Shift f(x) 7 units to the right

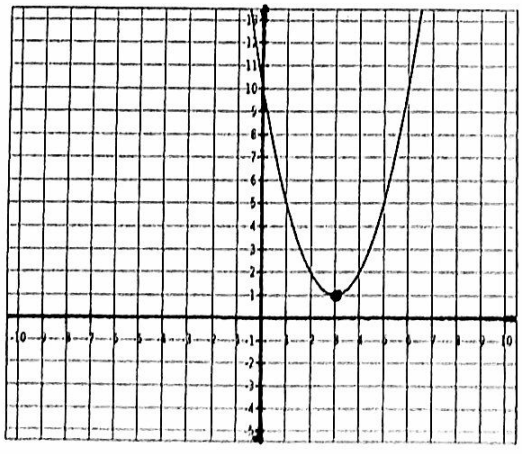
- New vertex: _____
- New function: _____

c) Shift f(x) 10 units down and 11 units to the right

- New vertex: _____
- New function: _____

3. The graph of h(x) is shown below:

$$h(x) = (x-3)^2 + 1$$



a) Shift f(x) 4 units down

- New vertex: _____
- New function: _____

b) Shift f(x) 9 units to the left

- New vertex: _____
- New function: _____

c) Shift f(x) 12 units up and 1 unit to the right

- New vertex: _____
- New function: _____

Lesson Plans 1

Topic: Day 9-Linear Functions Foldable

TEKS:
(3) Linear functions, equations, and inequalities. The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations. The student is expected to:

(A) determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including $y = mx + b$, $Ax + By = C$, and $y - y_1 = m(x - x_1)$;

(C) graph linear functions on the coordinate plane and identify key features, including *x*-intercept, *y*-intercept, zeros, and slope, in mathematical and real-world problems;

My learning objective:
I will learn about linear functions. I will identify each part that makes up a linear function. I will identify slope and the y-intercept.

Teaching strategies that will make this activity fun and exciting.	Materials:
Will begin the instruction by having them discover what a line is. We will define what a line is and learn the different types of slope and the y-intercept from the formula y=mx+b. We will practice to find the slope and y-intercept from a function and from a graph.	-markers -grid poster board paper

Activity 1: We will match a graph to an function according to the slope and y-intercept.
Duration: 45 minutes

Lesson Plans 1

Topic: Potential and Kinetic Energy

TEKS:
Physics 6B: Investigate examples of kinetic and potential energy and their transformations

My learning objective:
Understand the two basic types of energy and how they relate to each other.

Teaching strategies that will make this activity fun and exiting.

- Relatable examples of topics
- Kagan
- Stations

Materials:

- Computers
- Ramps/Rolling Material
- White Boards
- Physical Examples (in activity 2)
- Dry erase markers
- Erasers

Activity 1: Introducing the Concepts Duration: 25 min

To introduce the topic, students will watch introductory video on kinetic and potential energy. Demonstration of concepts (Video). Concepts introduced are:

- Energy
- Mechanical, Kinetic and Potential Energy
- Gravity, Mass and Velocity
- Units

Videos to Introduce topics. Students will also be computing quick KE and PE examples.

https://www.youtube.com/watch?v=7K4V0NvUxRg

http://study.com/academy/lesson/kinetic-energy-to-potential-energy-relationship-in-different-energy-types.html

https://kcos.pbslearningmedia.org/resource/hew06.sci.phys.maf.rollercoaster/energy-in-a-roller-coaster-ride/#.WOGDJvnytPY

Powerpoint
http://www.peoriapublicschools.org/cms/lib2/IL01001530/Centricity/Domain/1472/Intro%20to%20Energy.pdf

Activity 2: Stations of Physical Examples Duration: 20 min.

Students will go to different stations of examples of kinetic and potential energy

- Bouncy Ball
- Ramps
- Wind-up Car
- Rubber Bands
- Yo-yo
- Mousetrap
- Swing
- Pendulum…

Lesson Plans 1

Activity 3: Team potential or team kinetic? Duration: 15 min.

Students will demonstrate that they can identify kinetic and potential energy by moving to two different sides of the room. They will then explain why they are on the side they are on.

ADP MaST Academy Survivor Summer Camp at Canutillo High School

Please answer the following questions accordingly.

1) How does the Temperate Deciduous Forest differ from the other forests? What makes it unique?

2) How does teamwork influence your survivor rate?

3) What is the difference between probability with replacement and probability without replacement?

4) What unique memory do you have about constellations?

5) When and where can we use scale factor to help us survive?

6) Explain two adaptations for desert animals.

7) Mention two interesting things you learned about the Tundra Biome.

8) What are the four major parts of a map?

9) What is the point of testing every dimension when making an open box?

10) What is the difference between hot air molecules and cold air molecules?

11) How do organisms survive in different environments?

12) What measurement can you find with an astrolabe?

13) For star navigation, do you remember what you can find with an astrolabe?

14) How can you locate the North Star?

15) What is one thing you remember from the trigonometric ratios?

16) What science do you remember from the trash bag mini lesson?

17) What is one thing you remember from the spear fishing lesson?

18) What is one thing you remember from search and rescue area lesson?

19) How can you use similar triangles for indirect measurements?

20) What happens when light hits a mirror?

21) What do you remember about Newton's Laws of Motion?

22) How does surface area affect the buoyant force applied to a boat?

23) What do you remember about the M&M and Skittles exponential growth and decay?

24) How can you apply quadratics to the real world?