SIX FLAGS FIESTA TEXAS

Mathematics & Science Day

Integrated Mathematics & Science Activities

For Middle School

Grades 6-8

Instructions For Using This Document

(Depending on version of **Adobe® Reader®**, location of features/tool bars may vary)

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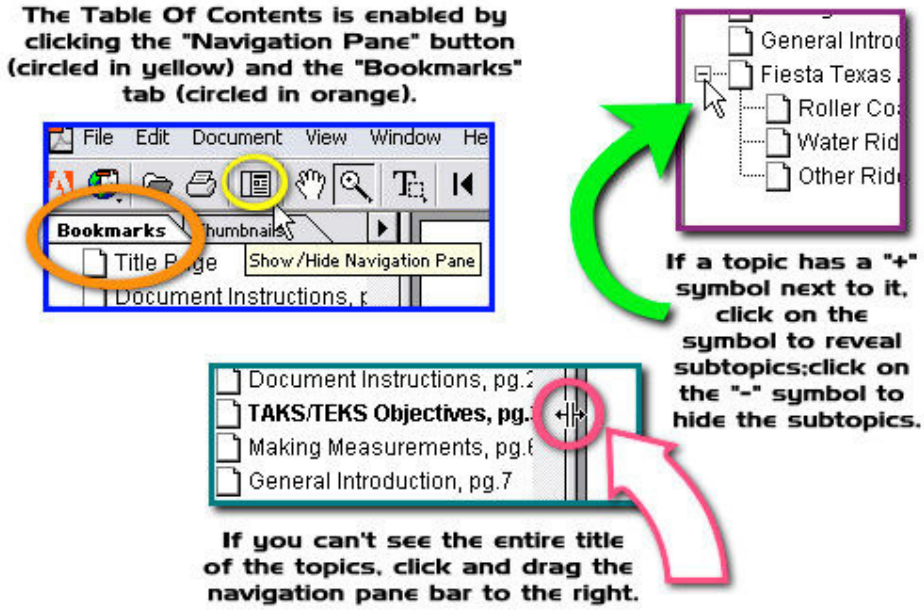

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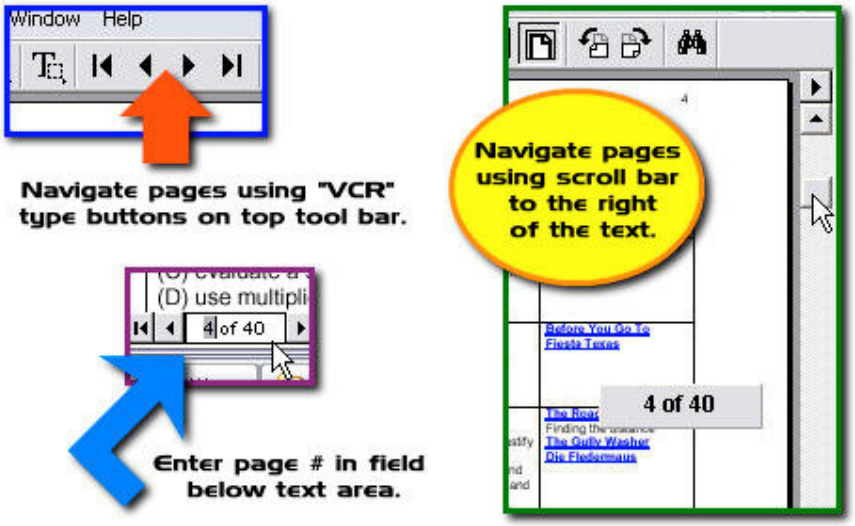

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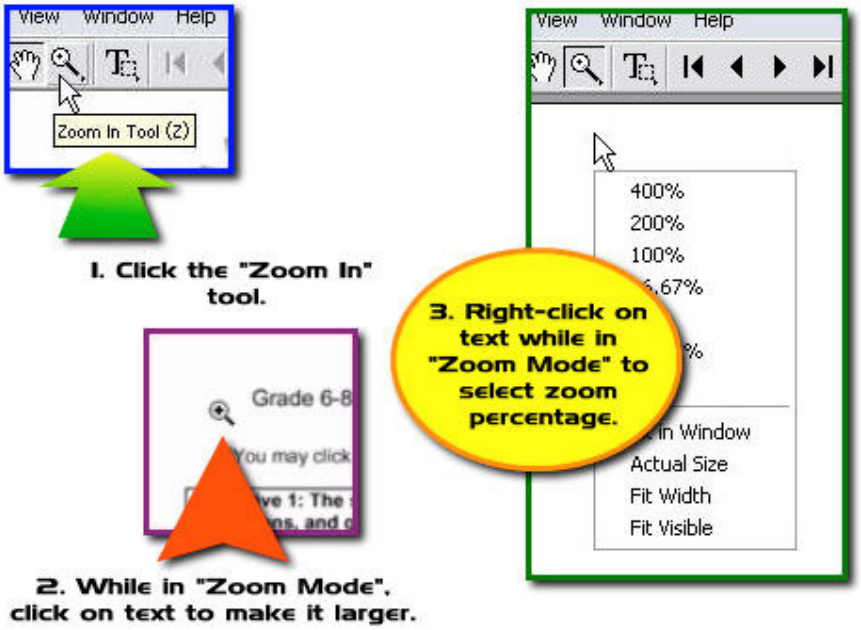

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TAKS/TEKS

Grades 6-8 Math TAKS Objectives and Correlated TEKS

(You may click on underlined text to go to that section of the workbook)

Objective 1: The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.	
(6.1) Number, operation and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms the student is expected to: (E) identify factors and multiples including common factors and common multiples.	**Die Fledermaus** – Using problem solving techniques.
(6.2) Number, operation and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve problems and justify solutions. The student is expected to: (B) use addition and subtraction to solve problems involving fractions and decimals.	**Before You Go To Fiesta Texas**
(7.2) Number, operation and quantitative reasoning. The student adds, subtracts, multiplies, or divides to solve problems and justify solutions. The student is expected to: (B) use addition, subtraction, multiplication, and division to solve problems involving fractions and decimals; (D) use division to find unit rates and ratios in proportional relationships such as speed, density, price, recipes, and student-teacher ratio; (F) select and use appropriate operations to solve problems and justify the selections; and (G) determine the reasonableness of a solution to a problem.	**Road Runner Express** – Finding the distance **The Gully Washer** **Die Fledermaus**

(8.2) Number, operation and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to: (A) select and use appropriate operations to solve problems and justify the selections; (B) add, subtract, multiply, and divide rational numbers in problem situations; (C) evaluate a solution for reasonableness; and (D) use multiplication by a constant factor (unit rate) to represent proportional relationships; for example, the arm span of a gibbon is about 1.4 times its height, *a*=1.4*h*.	**Road Runner Express** – Finding the distance **Crackaxle Canyon** – Determining the height of the quarry wall **Die Fledermaus** – Calculating the speed of a ride
Objective 2: The student will demonstrate an understanding of patterns, relationships and algebraic reasoning.	
(7.3) Patterns, relationships and algebraic thinking. The student solves problems involving proportional relationships. The student is expected to: (A) estimate and find solutions to application problems involving percent; and (B) estimate and find solutions to application problems involving proportional relationships such as similarity, scaling, unit costs, and related measurement units.	**Dornröschen** – Calculating percentages. **Scream** – Determining the height
(7.4) Patterns, relationships and algebraic thinking. The student represents a relationship in numerical, geometric, verbal, and symbolic form. The student is expected to: (A) generate formulas involving conversions, perimeter, area, circumference, volume, and scaling; (B) graph data to demonstrate relationships in familiar concepts such as conversions, perimeter, area, circumference, volume and scaling.	**Back at School**
(8.3) Patterns, relationships and algebraic thinking. The student identifies proportional relationships in problem situations and solves problems. The student is expected to: (B) estimate and find solutions to application problems involving percents and proportional relationships such as similarity and rates.	**Road Runner Express** – Finding the distance **Crackaxle Canyon** – Determining the height of the quarry wall **The Gully Washer** **Dornröschen** – Calculating percentages **Scream** – Determining the height

Objective 3: The student will demonstrate an understanding of geometry and spatial reasoning	
(8.7) Geometry and spatial reasoning. The student uses geometry to model and describe the physical world. The student is expected to: (A) draw solids from different perspectives.	**Dornröschen** – Calculating percentages **The Crow's Nest** – Draw different perspectives
Objective 4: The student will demonstrate an understanding of the concepts and uses of measurement	
(6.8) Measurement. The student solves application problems involving estimation and measurement of length, area, time, temperature, capacity, weight, and angles. The student is expected to: (A) estimate measurements and evaluate reasonableness of results; (B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter and circumference), area, time, temperature, capacity and weight; (C) measure angles.	**The Rattler** – Finding the highest point on the ride **The Power Surge** – Determining the wait
(7.9) Measurement. The student solves application problems involving estimation and measurement. The student is expected to: (A) estimate measurements and solve application problems involving length (including perimeter and circumference), area, and volume.	**The Rattler** – Finding the highest point on the ride
(8.9) Measurement. The student uses indirect measurement to solve problems. The student is expected to: (B) use proportional relationships and similar shapes to find missing measurements.	**Scream** – Determining the height
Objective 5: The student will demonstrate an understanding of probability and statistics.	
(6.9) Probability and statistics. The student uses experimental and theoretical probability to make predictions. The student is expected to: (B) find the probabilities of a simple event and its complement and describe the relationship between the two.	**The Midway** – Determine the probability
(6.10) Probability and statistics. The student uses statistical representations to analyze data. The student is expected to: (B) use median, mode, and range to describe data; (D) solve problems by collecting, organizing, displaying and interpreting data.	**Throughout the Park** **The Rattler** – Collecting, graphing and interpreting data

(7.12) Probability and statistics. The student uses measures of central tendency and range to describe a set of data. The student is expected to: (A) describe a set of data using mean, median, mode, and range.	**The Power Surge** – Determining the wait
Objective 6: The student will demonstrate an understanding of the mathematical processes and tools used in problem solving.	
(6.11) (7.13) (8.14)	**Die Fledermaus** – Using problem solving techniques

Making Measurements

Time

The times that are required to work out the problems can easily be measured using a watch with a second hand, a digital watch with a stopwatch mode, or a stopwatch. When measuring the period of a ride that involves circular motion, measure the time for several repetitions of the motion, then divide by the number of repetitions. This will give a better estimate of the period of motion than just measuring one repetition. You may want to measure two or three times and then take an average.

Distance

Since you cannot interfere with the normal operation of the rides, you will not be able to directly measure heights, diameters, etc. All but a few of the distances can be measured remotely using the following methods. They will give you a reasonable estimate. Try to keep consistent units, i.e. meters, centimeters, etc., to make calculations easier.

- **Pacing:** Determine the length of your stride by walking at your normal rate over a measured distance. Divide the distance by the number of steps and you can get an average distance per step. Knowing this, you can pace off horizontal distances.
- **Ride Structure:** Distance estimates can be made by noting regularities in the structure of a ride. For example, tracks may have regularly spaced cross bars as shown in ***figure a*** below.

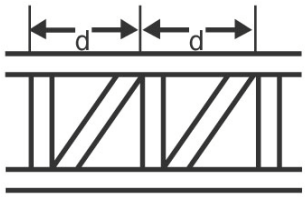


figure a

- **Using the Height Finder:** (This is known as Triangulation) See attached instructions

General Introduction

To the Teacher:

The activities found in this workbook were written to focus on specific skills and interesting questions about the rides and other features throughout the park at ***Six Flags Fiesta Texas***. Our activities incorporate mathematics and science appropriate for the middle grades. We recommend that you take the time to carefully look at these activities to choose which ones are appropriate for your students. We believe that students should be given a reasonable set of well-defined lesson goals to accomplish at the park.

Students will have a more enjoyable and successful day at the park if they have had practice with a variety of measuring devices *before* visiting ***Fiesta Texas***. If you want students to use the Height Finders, we suggest that they are constructed and used for practice before coming to the park. When constructing the Height Finder you can either copy the page from this workbook onto **card stock** or run regular copies that can be cut and attached to **index cards**. Laminating the Height Finders would keep them in better working condition for a longer period of time. You should also discuss measurement and data-gathering tools, strategies, and concepts with students before coming to the park.

We have included information that would allow you or your students to develop additional activities or questions if you so desire. Data about the rides and an activity template can be found in the teacher section.

Electronic data-collecting devices can be used on any of the activities but were not included because some schools have not yet acquired the needed technology. If you have been using this technology and feel comfortable in letting students take it to ***Fiesta Texas***, please feel free to add to the equipment needed and adjust the activities to accommodate the change in procedure.

We hope you enjoy your day of fun with science, mathematics, and discovery at ***Fiesta Texas*****!**

Developed by
Mentor Teachers
San Antonio Urban Systemic Initiative
Revised Jan. 2001

Fiesta Texas Approximate Data

Roller Coasters:

Superman Krypton Coaster:
Height 170 ft
Max. Speed 66 mph
Length of train 45 ft
Weight empty train 16,000 lbs; 36 seats
Height of loop 120 ft

Rattler:
Height 186 ft
Max. speed 55 mph
Length of train 5 ft
Weight empty train 14,000 lbs; 20 seats
Uses 250 hp, 480V 3 phase motor

Boomerang:
Height 125 ft
Max. Speed 42 mph
Length of train 48 ft
Weight empty train 14,000 lbs; 32 seats
Height of loop 43 ft
Uses hydraulic motor

Park power comes in at 34,500 volts; peak usage 7 Megawatts.

Fiesta Texas Approximate Data

Water Rides:

Power Surge:
Height 55 ft
Length of boat 16 ft
Weight of empty boat 1,700 lbs
100 hp pump; about 320,000 gallons water

Bugs' White Water Rapids:
Conveyor belt travels at 1 ft/sec
Main drop 40 ft
370,000 gallons water

Gully Washer:
3 pumps; 240 hp, 18 ft of head each
375,000 gallons water

Other Rides:

Bumper Cars:
480 volt 3 phase rectified to 90 Volts DC; 1 hp motors
300 lbs empty car

Train:
Length of track 0.9 miles
Average speed 3-5 mph

Data from Roller Coaster Database

Information found at **www.rcdb.com**

Fiesta Texas

Boomerang:

Length 266.7 m; Height 38.1 m; Inversions 3; Speed 77.2 km/hr;
Duration 1 min: 48s; Capacity 750 riders/hr

Rattler:

Length 1548.4m; Height 54.7m; Drop 37.87m; Inversions 0;
Speed 104.6 km/hr; Duration 2 min: 26s; Angle of Descent 61.4^0

Road Runner Express:

Length 731.5m; Height 22.3m; Inversions 0; Duration 2 min; 24s;
Capacity 1800 riders/hr

Superman Krypton Coaster:

Length 1226.8m; Height 51.2m; Inversions 6; Speed 112.7 km/hr;
Duration 2 min: 35s; Capacity 1600 riders/hr

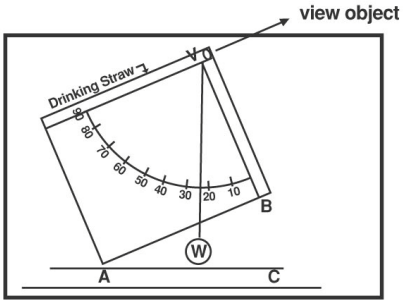
List of Equipment Needed

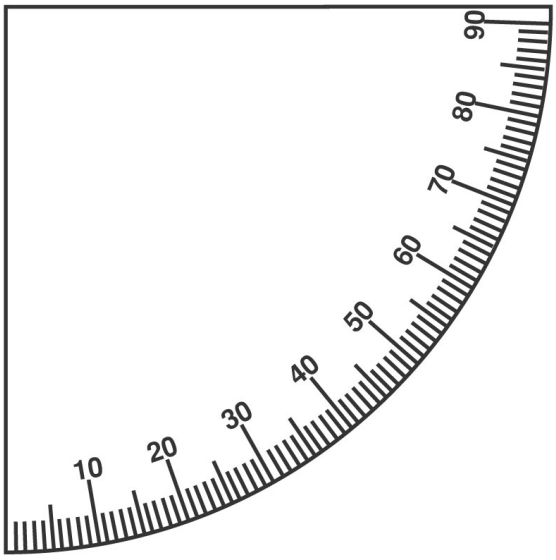
1**. Watch** - One person per group should have a watch with a second hand **or a stopwatch.**
2. **Height Finder**- Construct as indicated on the following page or bring ones from the school made for this purpose. One per group **(Materials for construction: kite string, paper clips, drinking straws, tape, index cards**)
3. **Measuring tape** with centimeters - one per group
4. **Pencil and Fiesta Texas Activity Workbook**
5. **Backpack** or fanny pack per group to hold equipment when on rides
6. **Coin** or one inch metal washer
7. **Calculator** - one per group

Constructing a Height Finder

Have students construct a height finder before going to the park:

- Cut out the protractor below.
- Glue or tape it to an index card so that the 90° edge is along one edge of the card. (Or this page can be copied onto card stock and then cut.)
- Cut a straw (with a large diameter) the length of the edge of the protractor.
- Lay the cut piece of straw along the index card where the 90° edge is located and tape in place (this becomes the scope for sighting the object being measured).
- Cut a piece of kite string about 20 cm. Open one tip of a paper clip so that it can be used as a pointer. Attach the string to the curved end of the paper clip.
- Poke or punch a hole in the index card protractor at the corner opposite the numbers. Attach the other end of the string through the hole. Be sure the string is long enough so that the paper clip pointer hangs across the numbers at the bottom.
- When viewing through the straw hold the end opposite of where the string is attached nearest your eye.





Tangent Table

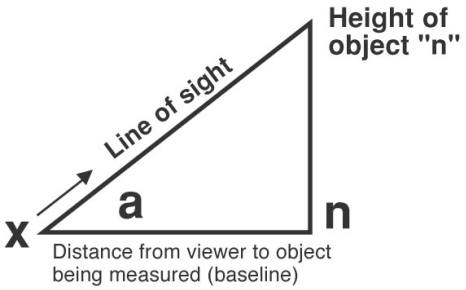
Attach to the back of the Height Finder

Table of Tangents

Angle	Tan.	Angle	Tan.	Angle	Tan.	Angle	Tan.	Angle	Tan.
1	.02	17	.31	33	.65	49	1.15	65	2.14
2	.03	18	.32	34	.67	50	1.19	66	2.25
3	.05	19	.34	35	.70	51	1.23	67	2.36
4	.07	20	.36	36	.73	52	1.28	68	2.48
5	.09	21	.38	37	.75	53	1.33	69	2.61
6	.11	22	.40	38	.78	54	1.38	70	2.75
7	.12	23	.42	39	.81	55	1.43	71	2.90
8	.14	24	.45	40	.84	56	1.48	72	3.08
9	.16	25	.47	41	.87	57	1.54	73	3.27
10	.18	26	.49	42	.90	58	1.60	74	3.49
11	.19	27	.51	43	.93	59	1.66	75	3.73
12	.21	28	.53	44	.97	60	1.73	76	4.01
13	.23	29	.55	45	1.00	61	1.80	77	4.33
14	.25	30	.58	46	1.04	62	1.88	78	4.70
15	.27	31	.60	47	1.07	63	1.96	79	5.14
16	.29	32	.62	48	1.11	64	2.05	80	5.67

Using a Height Finder
(Triangulation)

When you want to determine the height of an object that you cannot physically measure, it can be done by applying a little geometry. Imagine that you are at the bottom point **(x)** of the diagonal side (hypotenuse) of a right triangle looking up at the top along the hypotenuse (where the top of the object **(n)** you are measuring is located). The angle **(a)** created between your view up the hypotenuse and a horizontal line from your eyes to the object **(n)** can be measured with the Height Finder. When an object is sighted through the Height Finder, the number of degrees in **angle a** can be read from the pointer. Find the appropriate **tangent** from the tangent table provided.

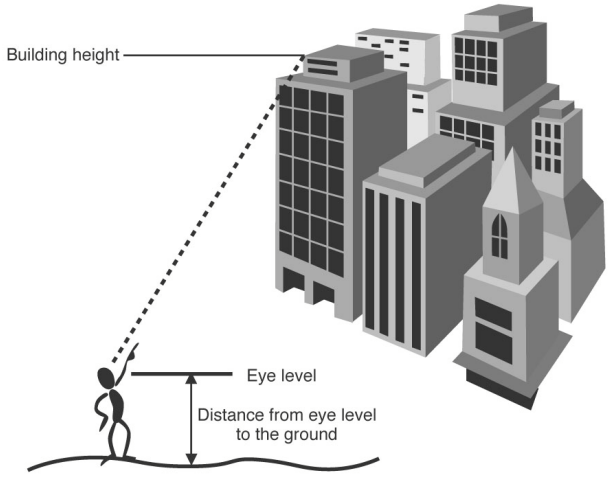


Formula:

Tangent of angle a (in degrees)_____ times the baseline distance (_____ meters) + your eye level height = height of the object
OR
[Tan a^{o}] x [baseline] + eye level = height

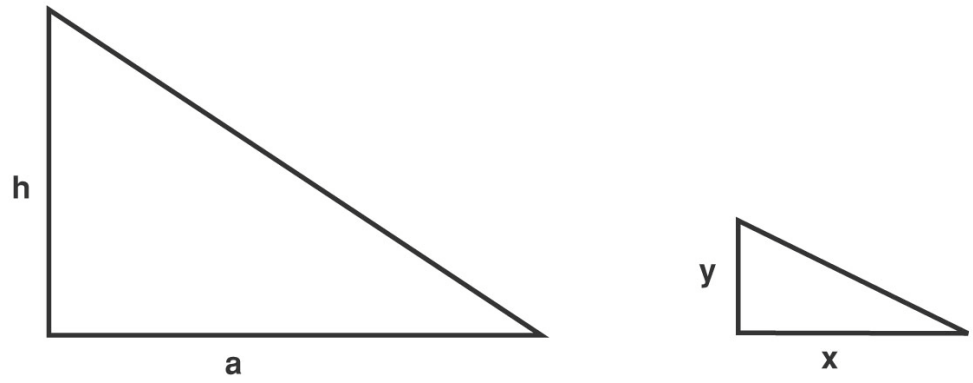
Example:
If angle a = 36^{o}, it would have a tangent of .73. If the distance of the baseline from you to the object were 120 ft. (or 1,440 inches), and your eye level height were 43 inches, then the equation to find the height of "n" would be as follows:

[.73 x 1440 in.] + 43 in. = 1094.2 in. (91.18 ft.)



Finding the Height of an Object Using Ratio and Proportion

Method I:



Legend:

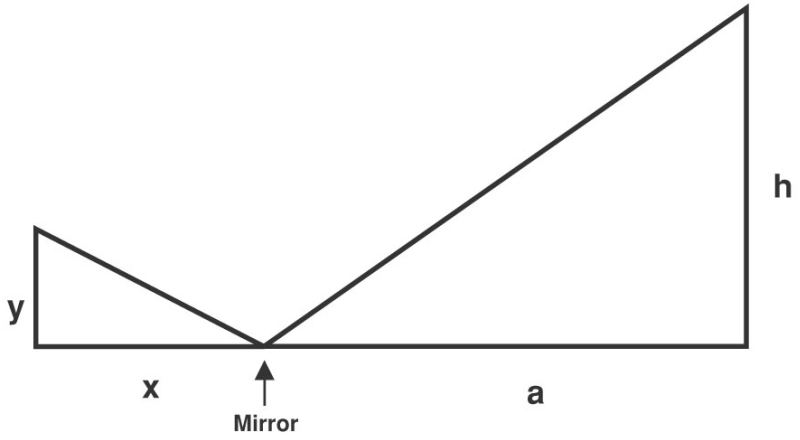
h = height of the object
a = length of shadow of the object
y = height of the observer
x = length of shadow of the observer

Equation to solve (solve for h):

$$\frac{h}{a} = \frac{y}{x}$$

Finding the Height of an Object Using Ratio and Proportion

Method II:



Legend:

h = height of the object
a = distance from mirror to the object
y = height of the observer
x = distance from mirror to the observer

Place the mirror so that you can see the top of the object being observed.

Equation to solve (solve for h):

$$\frac{h}{a} = \frac{y}{x}$$

Before You Go To Fiesta Texas

Introduction:

Planning your budget is one of the most important parts to a successful field trip. In order to have a successful trip to **Fiesta Texas**, think about any money you might want to take with you.

Mission: Problem solving with decimals: (Math TEKS 6.2B, 7.2B)

Before you go on a field trip you need to plan a budget. If you plan to play 2 boardwalk games, eat lunch, buy a souvenir, and buy an additional drink during the day, what is a reasonable amount of money to take on your trip? Justify your answer.

Activity or item	Price Range
Boardwalk games	**$1.00 - 2.00**
Meals	**$4.00 - 8.00**
Souvenirs	**$1.00 - 25.00**
Drinks	**$2.00 - 5.00**
Refillable Souvenir Glass with Soda	**$4.00 - 6.00**
Soda Refill in Souvenir Glass	**$1.50 - 2.50**

Introduction:

It is always good to learn a little about the background or history of places you visit. What could you learn about the place where Fiesta Texas was built?

Mission: Learning about quarries (Science 7.14C)

Fiesta Texas is built on an old abandoned limestone quarry site. Many quarries are located in the San Antonio area. Why is this so? What is a quarry and why is it important to the city's economy?

Introduction:

There are examples, all around us, of natural and manmade things breaking down or deteriorating (called weathering) because of their exposure to various conditions in the atmosphere.

Mission: Recognize and identify examples of weathering

(Science TEKS: 6.2B,7.2B, 7.7A, 7.148, 8.2B)

Before you go to the park, locate and list the types of chemical and physical weathering that are possible. When you go to the park look for as many examples of both chemical and physical weathering as you can find. Write down where you saw them. (Be specific. Did you see them on buildings, rocks, rides, etc.?) Describe what they looked like.

Throughout the Park

Introduction:

Did you ever think you would mention ***Fiesta Texas*** when you talked about systems? When you think of systems as anything that has parts, you can apply it to almost anything.

Mission: Identifying systems (Science TEKS: 6.2C. 6.5A & B, 7.2C)

Pick two things from anywhere in the park that would come from different systems (one very large and one very small). Describe each one and identify all the parts that make it a system.

Pick two systems that interact from anywhere in the park. Describe each system and tell how they interact and influence each other.

Introduction:

Parks like ***Fiesta Texas*** are designed to anticipate the number of people that can safely be in the park at a time. Engineers estimate the number of people who can fit in line for a ride, and the number of people who can ride a ride at anyone time for safety reasons.

Mission: Estimating and communicating (Math TEKS 6.10; Science TEKS 6.4B)

Choose three rides. Estimate the number of people who can ride at one time and describe in terms of median and range.

Los Festivales

Location: Boomerang (Steel Roller Coaster)

Introduction:
Even though each ride seems to run so smoothly, do you think it takes much effort to make them operate smoothly? Think about the amount of energy it takes for this ride to operate.

Mission: Identifying Potential and Kinetic Energy (Science TEKS: 6.2D,7.2D,7.4B, 7.8A, 8.2D)

Draw the main shape of the Boomerang ride. Put a "P_e" at the locations of two examples of potential energy in the ride and a "P_e" for two examples of kinetic energy. Explain your answers.

Crackaxle Canyon

Location: The Rattler (Wooden Roller Coaster)

Introduction:
This world-class wooden roller coaster is known for its rapid descents, fast aggressive corners, high speed, and sudden direction changes. Have you ever wondered who rides the roller coasters and why people love to ride these exciting rides? Let's investigate!

Mission: Collecting, graphing and interpreting data
(Science TEKS: 6.2B, 6.4B, 7.2 B, 8.2B, Math 6.10D).

Observe the ride at least once as a group. What things did you notice about the ride? Gather data by selecting one of the following.

a. Does the time vary from ride to ride? Time the ride from beginning to end five times. Do the times vary? Why or why not? Graph your results.

b. Tally the number of males vs. females during three ride cycles. Are there more males than females? Why or why not?

c. Tally the approximate age of the riders in two ride cycles (classifications should include: child, young adult, adult and older adult). What age group is most represented? Give possible reasons for your results.

d. Who rides in the front and in the back of the Rattler? Tally the people riding the Rattler. Do more males ride the front and/or back of the coaster? Why or why not?

e. Do you have a question of your own to examine? Investigate a question that can be answered by collecting data.

Crackaxle Canyon

Location: The Rattler (Wooden Roller Coaster)

Introduction:

The highest point of any ride usually determines how "thrilling" a ride will be for the riders. What is the highest point of the Rattler?

Mission: Finding the height of the highest point of the ride

(Math TEKS 6.8)

a. To find out, use your height finder by sighting through the straw toward the highest point of the ride. In front of the entrance to **The Rattler**, you will find a sign **(RATTLER HEIGHT-BEGIN HERE**) that shows where to stand to do this activity. What is the distance from there to the base of the Rattler? _____When using the height finder notice and record the angle of the pointer **(this is angle a)**.

b. Use the following formula to determine the height of this ride.

[Tangent of angle a (in degrees)] X [baseline distance (meters)] + your eye level height = height of the object

(Another way to do this is by using a graphing calculator - with the trigonometric functions)

Crackaxle Canyon

Location: Road Runner Express (Steel Roller Coaster)

Introduction:

All aboard your own **ACME rocket** for an exciting ride that dramatically plunges between the sides of the quarry wall and The Rattler's tracks. Are you up to this?

Mission: Finding the distance (Math TEKS: 8.2, 8.3B)

Time the ride from beginning to end. If the speed of the rocket is 42 mph then you can calculate the distance by using this formula:

rate (the speed) x time = the distance

Hint: The answer is not 84.

Crackaxle Canyon

Location: Road Runner Express (Steel Roller Coaster)

Introduction:
Have you ever stopped to think about how things work? There are simple machines around us everywhere, even in a theme park.

Mission: Identifying simple machines (Science TEKS: 6.2C 6.6B, 7.2C&D, 7.5A, 7.6A, 8.2C)

At the entrance to the Road Runner Express ride, before you walk up to get in line, there are examples of simple machines. Draw them and explain how they work.

Crackaxle Canyon

Introduction:

If you had to exit the park by climbing up the quarry wall would you have to climb very far? To see exactly how far it would be try this activity.

Mission: Determining the height of the quarry wall (Math TEKS: 8.2, 8.3B)

a. To determine the height of the quarry wall, use your height finder. Notice and record the angle of the pointer **(this is angle a).**

b. In Crackaxle Canyon, near the train station, you will find a sign **(QUARRY WALL HEIGHT-BEGIN HERE)** that shows where to stand to do this activity. What is the distance from there to the bottom of the quarry wall? _____Stand at the location indicated to make your measurements with the height finder. Using the following formula, determine the highest point of the quarry wall in front of you.

[Tangent of angle a (in degrees)] X [baseline distance (meters)] + your eye level height = height of the object

Crackaxle Canyon

Location: The Gully Washer (River Rapids Ride)

Introduction:

Get ready to be wet and wild in a twisting, turning, white water river ride complete with drenching waterfalls and long, winding, river embankments.

Mission: Determining rates of travel (Science 6.6A, 7.6B)

a. Determine the rate of travel in your boat.
The length traveled is a distance of 1800 ft. Time and record your ride from beginning to end.

b. Calculate the speed by using the following formula:

[Distance traveled (1800 ft)] ÷ [time it took to travel the entire distance] = the speed

c. How could you increase your rate of travel?

Spassburg

Location: Die Fledermaus (Swings)

Introduction:

Do you wonder what it feels like to ride aboard a spinning top? Riders on Die Fledermaus are seated in individual seats that swing from a rotating top. You'll have a swinging time!

Mission: Calculating the speed of a ride (Math TEKS: 7.2D)

Try this: time the ride from the moment it begins to the end of the ride. Also, count the number of rotations completed in that time. Compute the average number of rotations per minute.

Spassburg

Location: Die Fledermaus (Swings)

Introduction:

Have you and a pen pal or a friend ever written to each other in a secret code? Here is a mathematical secret code. See if you can figure it out!

Mission: Using problem solving techniques (Math TEKS: 6.1 E)

Maria's secret pen pal rode the Fledermaus and told her to meet him there. Her pen pal gave the following clues to Maria to determine who he was:

Number the swings #1 -- 48.
Omit every other swing starting with #2 (the even numbered swings) until only one person is left.
This is the pen pal.

In which seat is he sitting? What is the pattern for predicting which is the correct swing for any number of swings?

SUGGESTION: It may be helpful to draw this out.

Spassburg

Location: Steingasse (Bumper Cars)

Introduction:

The adult bumper cars feature a familiar trolley pole conductor that contacts with the electric ceiling grid and moves across a slick metal floor. Sparks will fly as you "bump" your way to fun.

Mission: Determining performance factors (Science 6.6a, 7.6b).

While you are in line to ride the bumper cars, pick which car is "best." In your group, decide on the three criteria you would use to describe the "best" car. Observe the group's "best" car during at least two riding cycles. Compare the results to your criteria. What did you observe?

a. After riding in your car, determine what you did that affected the performance of the car. Discuss your findings with your group and record your results.

b. Use your experience of driving a bumper car to compare the car's performance to the criteria your group developed. Explain any differences.

Spassburg

Location: Dornröschen (Carousel Ride)

Introduction:

Did you know that this Carousel ride is a replica of ornate, hand carved, rides commonly found in Germany in the 1900's? Ride back in time as you learn what makes a carousel special.

Mission: Determining the rate of motion (Science TEKS: 6.2B, 6.4A, 7.2B, 7.4A, 8.2B, B.4A).

a. Each member of the group should choose a different moving animal to observe. Count the number of times the animal goes up and down in one minute. Record and compare results for each of the animals observed.

b. Determine the time it takes for one complete rotation of the carousel. To do this, chose one animal and time how long it takes to complete an entire rotation. Record your results. Repeat this procedure to check for accuracy.

Mission: Calculating percentages (Math TEKS: 7.3A, 8.3B, B.7A)

a. Imagine a bird's eye view of the ride. Draw a diagram to show where the animals are in relation to the center of the ride. Be sure to include an accurate count of the total number of animals.

b. Count the number of stationary animals. Determine the percent of stationary animals of the total number of animals. Determine the percent of animals that ended in the up position, in the down position, and in the middle position.

Spassburg

Location: Dornröschen (Carousel Ride)

Introduction:

Moving objects are interesting to observe. Have you ever tried to compare an object thrown from a moving vehicle to an object thrown from a still position? Do you think they would behave the same or different? Try this next activity to figure it out.

Mission: Observing the path of moving objects (Science TEKS: 6.6A,B, 7.6B, 8.7 A).

a. Predict what would happen to a coin if it is dropped from the outer edge of the carousel while it is moving. What path would it take? Why do you think it would travel this path?

b. Get on the carousel and drop a coin from the edge. Record your results. Have each member of your group do the same procedure (dropping the coin form the same height each time). Record each person's results and describe any similarities or differences.

c. When you return to school, investigate how your results correlate to Sir Isaac Newton's First Law of Motion.

Rockville

Location: The Power Surge (Splash Boat Ride)

Introduction:

This refreshing boat ride will lift its passengers aboard a fiberglass boat to a height of 50 feet and then plunge them downward to an enormous "splashdown".

Mission: Determining the wait. (Math TEKS: 6.8A & B, 7.12A)

You must be back at the gate to meet your class in half an hour. You are at the end of a long line. After a quick count you realize you are the 100^{th} person in the line. How long will you wait before getting on the ride? Will you be able to get on this ride in time to meet your class?

Determine the average time it takes for one ride, including loading and unloading passengers. Consider the number of passengers on the ride and your position in line. Will you be able to meet your class on time?

Rockville

Location: Scream

Introduction:
How far is the fall?

Mission: Determine the height. (Math TEKS: 7.3B)

Measure the shadow cast by the Scream Tower. Using your partner's shadow length and actual height at the same time of the day, determine the actual height of the tower.

Location: The Midway (Skill Games)

Introduction: What are your chances of winning a game?

Mission: Determine the probability (Math TEKS: 6.9B)

Pick a midway game and describe the probability of winning in one round. Consider the number of participants and the number of chances.

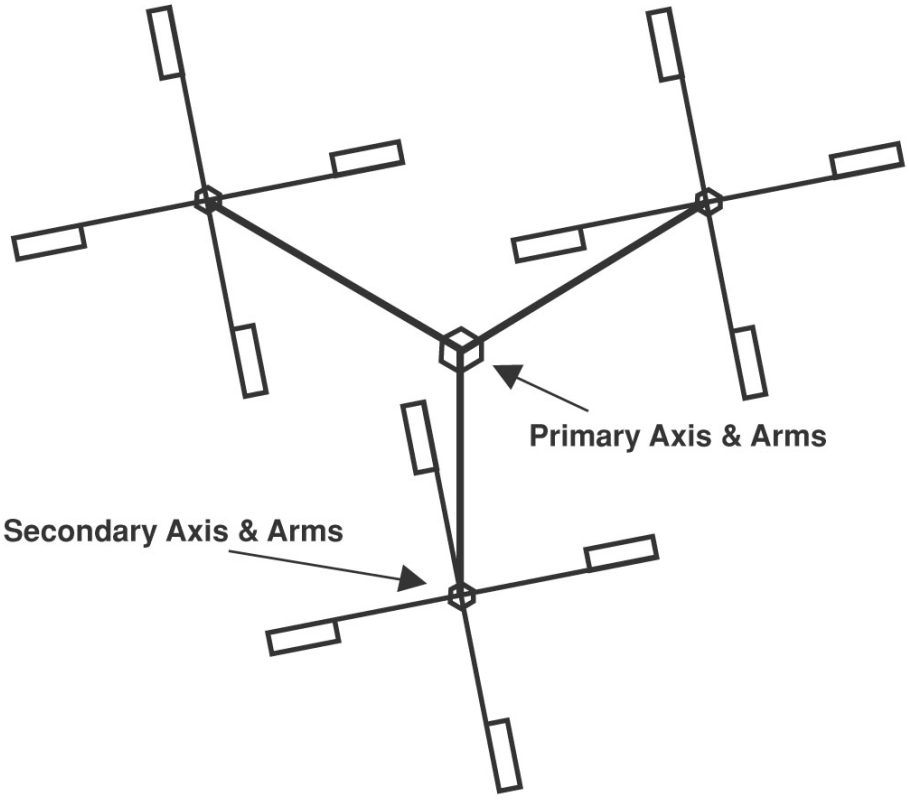
Fiesta Bay Boardwalk

Location: The Wave Runner (Scrambler)

Introduction:
This exciting ride will spin and rotate, changing speeds and directions, to produce a dizzying effect on the riders.

Mission: Describing forces (Science TEKS: 6.2D, 6.6B, 7.2D, 8.2D, B. 7A)

A force is a push or a pull. Forces are shown with arrows called vectors. Draw arrows in the diagram below to show the forces produced by this ride. Explain why you think the forces are being produced in the directions identified.



Fiesta Bay Boardwalk

Location: The Crow's Nest (Ferris Wheel)

Introduction:
Have you thought about what the park looks like from different locations?

Mission: Draw different perspectives. (Math TEKS: 8.A)
Sketch the Crow's Nest Ferris Wheel.

Front view:

Side view:

View from the top (looking down):

Fiesta Bay Boardwalk

Location: Any ride in this section

Introduction:

Have you ever noticed if your heart seems to beat faster when you get excited? Do you think riding a ride would have the same effect on you? You can find out how fast your heart is beating by taking your pulse and counting the number of beats in period of time. Try this activity and see what happens to your pulse.

Mission: Looking for differences in pulse rates (Science TEKS: 6.2B, 6.4A, 6.12B, 7.2B, 7.4A, 7.9B, 7.11B, 8.2B, 8.4A, 8.6B)

Find a pulse point on your body (your wrist, neck, or temple). Use a second hand on a watch or use a stop-watch. Count the number of pulses in 15 seconds and multiply by four. Be sure to use your pointer finger (not your thumb). **Take your pulse rate before riding, and after.** Is there a difference? Why is this so? You may want to collect this data before and after other rides as well.

Back at School

Introduction:

Have you ever thought of a ride that you think would be fun that doesn't exist? What would you have to know to design such a thing?

Mission: Designing a ride (Science TEKS: 8.5A)

Design a new ride that you have never seen before. Draw it and describe what it would be made of and how it would work. Discuss any design problems there might be in making such a ride and propose how you might solve those problems.

Back at School

Introduction:

Charts are used everyday in many things we see and use. It is an important skill to be able to use them to gather and interpret information. See how you do with this information from some of the rides you saw or rode at ***Fiesta Texas*.**

Mission: Use chart or graph to answer questions.

Specifications:

	Circumference	Diameter	Radius
Fiesta Bay Boardwalk (Crow's Nest Ferris Wheel)	**254.5 ft**	**81 ft**	**40.5 ft**
Spassburg Die Fledermaus (Swings)	**116.25 ft**	**37 ft**	**18.5 ft**
Crackaxle Canyon Wagon Wheel	**150.75 ft**	**48 ft**	**24 ft**

Describe the relationship between radius, diameter and circumference.

Generate the formula for finding the circumference of a circular object from the information given.

Find the circumference of a ride given a radius of 36.75 feet and explain what type of ride this might be.

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