

# Indiana Beach

BOARDWALK RESORT™

## ACADEMIC WORKSHEET

MID-LEVEL

### DIRECTIONS:

- Some questions require you to walk to a specific location within the park. Please use your park map to find the designated locations.
- Any supplies needed to answer a question (measuring tape, etc.) can be found at Guest Relations. Please leave supplies at Guest Relations for other groups to use as well; do not take supplies with you.
- Problems can be completed individually or as part of a group, as determined by your teacher. Chaperones may help with suggestions or hints should students become stuck, but the worksheets should be primarily completed by the students. When you complete the worksheet packet, please return the completed forms to your teacher.
- While enjoying your day at Indiana Beach Boardwalk Resort, please remember to walk at all times. Running is not permitted on park property.
- You may need to speak to an Indiana Beach employee to complete certain questions. Please note that if an employee is running a ride, the employee will not be able to answer any questions while the ride is running. This is for the safety of our guests.
- There is space at the back of the packet to show your work if needed.
- Don't forget to have fun!

Name: \_\_\_\_\_

School: \_\_\_\_\_

Teacher: \_\_\_\_\_



# RIDE HEIGHTS

Many rides at Indiana Beach require a rider to meet a specific height requirement. These height requirements are determined by ride manufacturers and the State of Indiana. By law, Indiana Beach cannot allow someone to ride a ride if the person does not meet the designated height requirement. For the convenience of our guests, the height requirements for each individual ride have been posted at the rides. As you complete this activity, you will need to look for the informational sign at the designated ride.



**You Will Need A Tape Measure To Complete This Problem.**

**STEP 1:** Use a tape measure (located at Guest Relations) to measure yourself in inches.

Your height in inches: \_\_\_\_\_

**STEP 2:** Convert your height to feet and inches.

Feet: \_\_\_\_\_ Inches: \_\_\_\_\_

Write your height as a decimal number (round to the nearest hundredth). \_\_\_\_\_

**STEP 3:** Find the informational sign at the entrance to the Hoosier Hurricane Roller Coaster.

How tall do you need to be (in inches) to ride the Hoosier Hurricane? \_\_\_\_\_

How tall do you need to be (in feet) to ride the Hoosier Hurricane? \_\_\_\_\_

**STEP 4:** If the top of the ride height sign is 72 inches from the ground and you are standing 36 inches from the sign, use the Pythagorean Theorem to find the hypotenuse between the bottom of your feet and the top of the ride sign (assuming the sign is perpendicular to the ground). You may use a calculator to find square roots.

*Pythagorean Hint:  $A^2 + B^2 = C^2$*

Hypotenuse: \_\_\_\_\_  
(Round to the nearest hundredth of a decimal.)

**STEP 5:** Pretend there are five people in your group. Two of you meet the height requirement and are able to ride the Hoosier Hurricane. Three of you are not tall enough to ride the Hoosier Hurricane.

What percentage of your group is tall enough to ride the Hoosier Hurricane? \_\_\_\_\_  
(Round to the nearest hundredth of a decimal.)

**STEP 6:** The Hoosier Hurricane train has 8 seats. Two people can fit in each seat. If the ride takes 5 minutes to load and run, and there are 50 people in line ahead of you, assuming every seat is filled each time the train runs the track, how long would you have to wait in line before you were able to ride the Hoosier Hurricane?

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**STEP 7:** Find the informational sign at the entrance to the Cornball Express. Adam is 32 inches tall. Brittany is 49 inches tall. Caleb is five feet tall. Danielle is 42 inches tall. Eve is taller than Adam but shorter than Danielle. Franklin is taller than Caleb. Gregory is 46 inches tall. Hunter is the tallest. Isabelle is the shortest. Jeffrey is four feet, three inches tall. Kathy is shorter than Brittany but taller than Gregory. Lisa is taller than Brittany but shorter than Jeffrey.

Put the children in order by height starting with the tallest and ending with the shortest.

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Is Lisa tall enough to ride the Cornball Express? \_\_\_\_\_

Is Eve tall enough to ride the Cornball Express? \_\_\_\_\_

Is Jeffrey tall enough to ride the Cornball Express? \_\_\_\_\_

Who is tallest: Caleb, Franklin, or Hunter? \_\_\_\_\_

**STEP 8:** I would like to ride the Cornball Express, but the steps are slippery. I don't want to get hurt so I will walk slowly. I can hear the ride operator's voice and he's telling me to be careful.

In the sentence above, would the word "slippery" be an adverb or an adjective? \_\_\_\_\_

Why? \_\_\_\_\_

Would the word "slowly" be an adverb or an adjective? \_\_\_\_\_

Why? \_\_\_\_\_

In the sentence above, is the word "operator's" plural or possessive? \_\_\_\_\_

Is the word "he's" a plural noun, a possessive noun, or a contraction? \_\_\_\_\_

**STEP 9:** Which sentence is correct? (*Circle your answer.*)

We were to short too ride the Cornball Express.      We was too short to ride the Cornball Express.

We were too short to ride the Cornball Express.      We was to short too ride the Cornball Express

***Have fun riding the Hoosier Hurricane and the Cornball Express!***

# RIDE TIMES

Indiana Beach has several different ride options to consider. We have roller coasters, flat rides, high rides, low rides, thrill rides, spinning rides, family rides, kiddy rides—there's something for the whole family!

**STEP 1:** For this problem, pretend your group will be spending 4 hours at Indiana Beach.

How many minutes are in 1 hour? \_\_\_\_\_

How many minutes (total) will you be spending at Indiana Beach? \_\_\_\_\_

**STEP 2:** There are 40 rides at Indiana Beach. Let's say each ride will take you 10 minutes (walking to the ride, standing in line, and riding the ride).

How many rides can you ride in 1 hour? \_\_\_\_\_ In 4 hours? \_\_\_\_\_

If you are here for four hours, will you be able to ride every ride at least once? \_\_\_\_\_

What rides do you, personally, want to make sure you ride before you leave? \_\_\_\_\_

**STEP 3:** In this scenario, it will take you 7 minutes to walk to and ride the Cornball Express. This does not include the time you will need to stand in line. The line for the Cornball Express will take you 15 minutes. But you also want to ride the Double Shot. It will take you 9 minutes to walk to and ride the Double Shot, and it will take you 23 minutes to stand in line. While standing in line, you decide you'd also like to ride the Scrambler. It will take you 6 minutes to walk to and ride the Scrambler, but you will only have to wait in the Scrambler line for 3 minutes.

To ride all three rides, how much time (total) will you need? \_\_\_\_\_

How much time (total) will you spend standing in line? \_\_\_\_\_

What percentage of your time will be spent standing in line? \_\_\_\_\_

(Round to the nearest whole number.)

**STEP 4:** Let's say you ride 10 rides. The first ride takes 5 minutes. The second ride takes 8 minutes. The third ride takes 4 minutes. The fourth ride takes 7 minutes. The fifth ride takes 10 minutes. The sixth ride takes 3 minutes. The seventh ride takes 3 minutes. The eighth ride takes 6 minutes. The ninth ride takes 6 minutes. The tenth ride takes 4 minutes.

What is the average ride time per ride? \_\_\_\_\_

**STEP 5:** Pretend you will need 20 minutes (total) to walk to, wait in line for, and ride the Steel Hawg. It takes you 4 minutes to walk to the Steel Hawg. It takes you 14 minutes to wait in line.

How long do you think the ride will last? \_\_\_\_\_

# MONEY MATH

Indiana Beach Boardwalk Resort offers a whole host of delicious food! We have ice cream, hot dogs, popcorn, cheeseburgers, elephant ears, tacos, pizza and more!

**STEP 1:** Visit the Beach Burger restaurant located near the north arcade. Please refer to your map if you need directions.

What is the price of Combo #1? \_\_\_\_\_

*Optional:* Sales tax in Indiana is 7%. How much tax will you need for Combo #1? \_\_\_\_\_

**STEP 2:** Let's say there are five people in your group. Your group has \$40.00 (total). If there is NO SALES TAX:

How much would it cost to purchase a Combo #1 meal for each person in your group? \_\_\_\_\_

Will you have enough money to purchase a Combo #1 meal for each member of your group? \_\_\_\_\_

Will you have enough money to purchase a Combo #1 for each member of your group if you are required to pay sales tax? \_\_\_\_\_

**STEP 3:** Visit the Skee-ball game room and take a look at the prize counter.

What is your favorite prize? \_\_\_\_\_

How many tickets would you need to win that prize? \_\_\_\_\_

Let's say you get 3 tickets every time you play Skee-ball.

How many times would you need to play Skee-ball to earn your favorite prize? \_\_\_\_\_

It costs \$1.00 to play Skee-ball 1 time. Each time you play you receive 3 tickets.

How much money would you need to win your favorite prize? \_\_\_\_\_

**STEP 4:** If one ride pass costs \$29.99 (no sales tax), how much money will you need to buy 6 ride passes?

\_\_\_\_\_

If you buy 6 ride passes and hand the seller \$200.00, how much change will you receive? \_\_\_\_\_

# PROBABILITY

**STEP 1:** There are 100 vehicles in the parking lot. 60 of those vehicles are cars, 30 are trucks, and the rest are school busses. What is the probability of a school bus leaving first? (Assuming each vehicle is equally as likely to leave.)

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*Hint: Try dividing the total number of vehicles by the total number of school busses.*

**STEP 2:** Let's say rubber ducks are a claw machine prize, and there are 4 blue rubber ducks, 5 red rubber ducks, and 20 yellow rubber ducks in the claw machine. Let's also assume that you will win a rubber duck prize every time you play the game. If you were equally as likely to snag any of the rubber ducks, what is the probability that you will catch a blue one?

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**STEP 3:** Pretend we talked to 50 students. We asked each student, "What is your favorite roller coaster?" 10 students chose the Hoosier Hurricane. 15 students chose the Cornball Express. 5 students chose the Tig'rr. 5 students chose the Lost Coaster of Superstition Mountain. 15 students chose the Steel Hawg.

If one of the 50 students is chosen at random, what is the probability that this student preferred the Hoosier Hurricane? \_\_\_\_\_

What percentage of the students prefer the Hoosier Hurricane? \_\_\_\_\_

What percentage of the students prefer the Tig'rr? \_\_\_\_\_

**STEP 4:** There are 100 students. 36 students wore black. 20 students wore white. The remainder of the students wore a color other than black or white. If a student was selected at random, and each student held the same likelihood of being selected, what is the probability of selecting a student in black?

# BAKING IN BLACK

**DID YOU KNOW?** An object's color has to do with the light wavelengths that are reflected by that object. White light is made up of all wavelengths mixed together. As the white light hits an object, certain wavelengths are reflected. A banana is yellow because yellow wavelengths are reflected. An apple is red because red wavelengths are reflected. White objects reflect all wavelengths. By contrast, black objects absorb all wavelengths. This is why a black shirt will feel hotter than a white shirt while standing in the sun. The white shirt reflects the wavelengths (staying cooler), while the black shirt absorbs them (getting hotter). This is a very rudimentary explanation, but when you travel to an amusement park and spend the whole day in the hot sun, think twice about wearing black!

# RAIN, RAIN, GO AWAY!

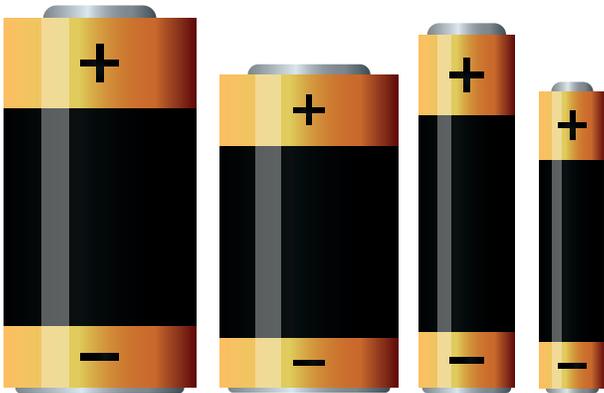
Did you know that lightning can travel up to 10 miles from its parent storm cloud? It's true! But what does that mean for Indiana Beach? Well, let's say there was a storm roughly 10 miles away from the park. Even though that storm was still 10 miles away, the lightning from that storm could travel far enough to strike above Indiana Beach! This is why the State of Indiana requires Indiana Beach Boardwalk Resort to close the waterpark and any high rides any time lightning is within 15 miles of the park. Just because we can't see the storm yet doesn't mean the lightning can't reach us! You certainly wouldn't want to be on a roller coaster with lightning headed your way!

To keep guests safe, the managers at Indiana Beach use radar to monitor storms as they form and move through the area. Employees in the park office watch as the storm approaches; they notify supervisors when the storm starts to get too close. This is why, sometimes, rides go down before you even know that there's a storm coming. You might not be able to see the storm, but the radar can!

**STEP 1:** Head on over to the Guest Relations building where you will find a pair of magnets. For this activity, you will need to understand that there are two types of electrical charges: positive (+) and negative (-). Charges that are similar will repel one another (push away from one another), while charges that are dissimilar will attract one another (pull one another closer). Basically, it's like this: a positive charge will repel another positive charge, but it will attract a negative charge. A negative charge will repel another negative charge, but it will attract a positive charge. Got it? Now, take out your magnets. Try to push the two magnets together.

Could you easily get the magnets to go together? \_\_\_\_\_

If you said "yes," this means one magnet was giving out a positive charge and one magnet was giving out a negative charge. The magnets were attracted to one another! If you said, "no," this means both magnets were giving out the same type of charge. Now flip one of the magnets over and try again. Can you feel the difference?



Batteries work in a similar fashion. Look closely at the two ends of a single battery. One end appears flat, and the other end has a little bump. The flat end gives off a negative charge (-). The end with the bump gives off a positive charge (+). Have you ever noticed that you have to install batteries a specific way to get them to work? That's because each end carries a different electrical charge. A positive charge will push away another positive, but it will attract a negative.

If you put the positive end (with the bump) next to another battery's positive end (the end with a bump), do you think the batteries would work?

Why or why not? \_\_\_\_\_

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**STEP 2:** Let's apply this information to electrical storms. As a storm moves through an area, it sends out an invisible, negative charge toward the earth. That negative charge works like a magnet, attracting positively-charged particles along the ground. Those positively-charged particles will travel up anything tall—buildings, roller coasters, flag poles, trees, even people—as they try to reach the storm. This is how we get lightning; it's the electrical channel between the storm and the earth. It's also why you don't want to be on a roller coaster during a thunderstorm. Those positively-charged particles in the ground are going to travel up that roller coaster as they try to reach the negative particles in the storm. The storm is going to be attracted to that roller coaster!

Why would lightning be more likely to strike the roller coaster than a person on the ground? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Not all lightning builds at the bottom of the storm, however. Sometimes, lightning builds at the top of the storm, which carries a positive charge instead of a negative charge. This is called "positive lightning." This "positive lightning" can strike up to 10 miles away from the storm's core. Pretend the storm is a body and the lightning is an arm. The Lightning Arm can reach up to 10 miles away from the Storm's Body. That's like reaching all the way from Buffalo to Monticello!

While it isn't an exact science, you can use math to guess how far you are from a storm. First, we need to know that light travels faster than sound. Think back to the last time you watched fireworks. If you were really close, you could probably see the lights in the sky at the same time you heard the loud BOOM. But have you ever watched fireworks from far away? Sometimes, if you're watching fireworks from far away, you will see the lights in the sky, and then there will be a short pause, and then you will hear the loud BOOM. This is because light travels faster than sound. The light and the BOOM happened at the same time, but because both had to travel for a while to get to you, the light was faster and got there first. If light and sound were in a long-distance race, light would win.

**STEP 3:** When a storm is still far away, you will be able to see the lightning before you can hear thunder. This is because light (lightning) will be traveling faster than sound (thunder). Once you see a strike of lightning, start counting the number of seconds that pass before you hear thunder. You can divide that number by 5 to guess how far you are from the storm.

Example: If you count 5 seconds, then  $5 \div 5 = 1$ , and the storm is roughly 1 mile away.

Example 2: If you count 10 seconds, then  $10 \div 5 = 2$ , and the storm is roughly 2 miles away.

Approximately how far is the storm if you count 25 seconds? \_\_\_\_\_

Approximately how far is the storm if you count 40 seconds? \_\_\_\_\_

If the storm is roughly 9 miles away, how many seconds should you be able to count between the strike of lightning and the crash of thunder? \_\_\_\_\_

Did you know that lightning can travel up to 10 miles from its parent storm cloud? It's true! But what does that mean for Indiana Beach? Well, let's say there was a storm roughly 10 miles away from the park. Even though that storm was still 10 miles away, the lightning from that storm could travel far enough to strike above Indiana Beach! This is why the State of Indiana requires Indiana Beach Boardwalk Resort to close the waterpark and any high rides any time lightning is within 15 miles of the park. Just because we can't see the storm yet doesn't mean the lightning can't reach us! You certainly wouldn't want to be on a roller coaster with lightning headed your way!

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**STEP 4:** This is a pretend scenario. Let's say a storm is moving toward Indiana Beach. You are standing outside on the boardwalk when you see lightning. You count 30 seconds before you hear thunder.

How far do you think you are from the storm? \_\_\_\_\_

According to Indiana Beach policy, would you be able to ride a roller coaster? \_\_\_\_\_

Why or why not? \_\_\_\_\_

We track a storm as it approaches, but we also track a storm as it moves out of the area. Just like lightning can strike ahead of a storm, it can also strike behind it. We want to let that storm get at least 15 miles away before we begin to reopen rides. Some rides are low to the ground, which means they will reopen quickly (like the Scrambler). Other rides will take longer to reopen. High rides (like the Skyride and roller coasters) will be the last to reopen. We cannot reopen high rides until 30 minutes AFTER lightning is officially 15 miles away. This means we must wait for the storm to move 15 miles away (by radar), AND THEN we must continue to wait another 30 minutes to reopen high rides. Guest safety is our top priority.

**STEP 5:** A storm is moving toward Indiana Beach at a steady rate of 30 miles per hour. At 1:15 PM, the ride supervisors close the Cornball Express because the storm is 15 miles from the park.

The storm is traveling 30 miles per hour. How many minutes will it take to travel 30 miles? \_\_\_\_\_

Use the previous answer to calculate how fast the storm is moving per minute. \_\_\_\_\_

How far will the storm travel in 10 minutes? \_\_\_\_\_

How far will the storm travel in 30 minutes? \_\_\_\_\_

If the storm takes 30 minutes to travel 15 miles, what time will the storm hit Indiana Beach? \_\_\_\_\_

**STEP 6:** At 1:15 PM, ride supervisors close the Cornball Express because an approaching storm is 15 miles from the park. Assume the storm maintains the same speed (30 miles per hour) as it moves directly toward Indiana Beach. Assume, also, that the storm itself is 15 miles in diameter, meaning it will take 15 minutes for the storm to completely pass Indiana Beach once it hits. Indiana Beach policy states that, once a storm passes the park, ride supervisors must wait until the storm has, once again, moved 15 miles away from the park before they are allowed to reopen low rides. They must, then, wait an additional 30 minutes before they are allowed to reopen high rides like the Cornball Express.

Can you estimate approximately what time the Cornball Express would reopen? \_\_\_\_\_

# HARD AT WORK

Please remember: if an employee is running a ride, the employee will not be able to answer any questions while the ride is running.

**STEP 1:** Find seven Indiana Beach team members (employees). Ask each team member for his/her name. Mark all seven names on the chart below. Ask each team member how long he/she has been working at Indiana Beach (1 year, 6 years, 10 years, etc.). Mark all answers on the chart below.

Team Member	Number of Years Worked at Indiana Beach
1	
2	
3	
4	
5	
6	
7	

**STEP 2:** Use the chart above to answer the following questions.

What is the average number of years worked (according to data collected)? \_\_\_\_\_

Find the median (middle value) in this list of numbers. \_\_\_\_\_

*Hint: To find the median, numbers must be written in numerical order.*

Is there a mode (number listed most often)? If so, find the mode. \_\_\_\_\_

What is the range of the numbers listed? \_\_\_\_\_



***You have now finished!***

***Enjoy the rest of your day!***