

### THE MIDWAY & GAMES GRADE 4 STEM

FORCING A WIN THE MIDWAY GAME PLAN



GRADE: Four

If you love playing games at the

State Fair, this is the activity for you. Did you know that with

you can learn the secret to winning your favorite lifesized stuffed animal? Discover how you can win your goldfish or stuffed animal by looking at the force needed to make just the

a little bit of math and science,

What's your game plan? It's time for some problem-solving action



### Forcing a Win The Midway Game Plan

#### In this lesson students will:

- ★ Use carnival games, such as the Ring Toss in the Midway, to understand mathematical relationships related to place value, number sense, and data analysis.
- **★** Test how the force they exert on an object changes the outcome of a game.
- ★ Design their own game to test their classmates' use of force.



# at the State Fair of Texas! 66666666

right toss.

## Standards ★ Math TEKS:

★ 4.1(A), 4.1(B), 4.1(C), 4.1(D), 4.1(E), ★ Science TEKS: 4.2(B), 4.2(E), 4.6(D) \* Art TEKS: 4.2(B), 4.4(A)

#### Before You Go

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- Review the concept of force as you watch this video.
- ★ Practice using force on objects in the classroom
  - by playing some of the following games:
    - \* Tossing a small beanbag through a hole in a chair
    - \* Tossing a ping-pong ball into a cup
    - \* Throwing small rings around the necks of bottles

GRADE: Four



# Forcing a Win The Midway Game Plan

- ★ Show <u>this video</u> about the Ring Toss game at Taylor Park Elementary.
- $\star$  Describe the pattern you see in the bottles.
  - \* How many points should a player receive if the ring lands on a red bottle?
- ★ Once a ring lands on a bottle, the bottle is removed from the arrangement.
  - \* If a player throws 3 rings, what's the greatest number of points the player can earn?
  - \* What if the player throws 6 rings?
  - \* What if the player throws 10 rings?
- ★ Who do you believe will have the most successful strategy for winning the Ring Toss game at Taylor Park Elementary: Abel or Omarion? Explain why.

#### Create this table in your notepad:

- As you determine which strategy will be most effective in helping you win the Ring Toss game, be sure to consider your position, the "spin" you use when you toss the ring, and the amount of force behind your toss.
- ★ Make a hypothesis: Will you use Abel or Omarion's strategy as you play your game, or will you develop your own?
- ★ Learn more about the Midway and its location in the fairgrounds at <u>www.bigtex.com</u>.

#### Plan Your Route.

★ Head to the Midway at the center of the Fairgrounds.

Spin

Position

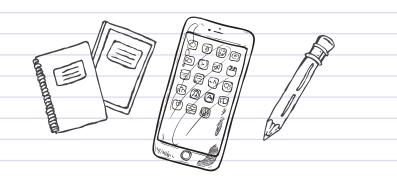


Points

Force

#### Optional Materials to Bring

- ★ Smart Phone or Tablet
- 🖈 Pencil & Notepad





### Forcing a Win The Midway Game Plan

#### While You're There

The objective of your visit is to determine the specific combination of strategies needed to win the game, including choosing the best position, whether to spin the ring or not, and the amount of force behind your toss. This will help you with two projects when you get back to school.

### THE THREE AMIGOS - POSITION, SPIN, AND FORCE

GRADE: Four

When you get to the Midway (or Kidway), head over to the Ring

- Draw a picture of the Ring
- Toss game in your notebook. It might look something like the image on the right ... You may choose to take a
- photograph instead, and that's Either try the game, or observe
- others playing. Answer the following
- Did it seem easy to toss the questions:
- ring correctly? What happened when you or
- someone else applied more
  - What about less force?

#### As you determine which strategy (or strategies) you will use, remember to take notes in your notepad! Here are a few additional things to pay attention to:

- What are the rules of this game?
- How are the bottles arranged?
- Do they keep score? If so, what was your score?
- How many times did you play the Ring Toss game?
- Record the results in your table.

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#### ROAMING

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- If you choose to play other similar games in the Midway, be sure to take notes on the strategy you use to play!
- Will you use the same strategy in these games that you did in the Ring Toss? Why

or why not?

After The Fair

When you return to class following your State Fair visit, you will:

- ★ Design a game in which you have to use specific force to win.
- ★ Complete the Midway Card Game

### DESIGN YOUR OWN GAME

- Write down your idea and make a sketch.
- Think about what the games looked like that drew you in the most.
- Was it the colors?
- Were there lights or sounds?
- In class you will present your idea and work with a
- group to create your game. After all the groups are finished, set up your own Kidway!



points

#### Forcing a Win GRADE: Jour The Midway Game Plan Midway Card Game 1. When a ring lands on a bottle, the bottle is removed from the arrangement (see Image 1). If a player is given 3 rings, what is the greatest number of points that player can earn? a. If a player is given 6 rings, what is the greatest number of points that player can earn? 00000000 b. If a player is given 10 rings, what is the greatest 00000000 number of points that player can earn? 000 $\bigcirc \bigcirc$ 0 2. List the patterns you observe in this bottle arrangement Ŏ 00 00 0 0 (see Image 1). $\mathbf{0} \mathbf{0} \mathbf{0} \mathbf{0} \mathbf{0}$ 0 O 3. More bottles are added to create a new edge on the bottle 000 $\bigcirc \bigcirc$ 0 O 00000000 arrangement (see Image 2). How many points should a player 000000 receive if a ring lands on these bottles? Explain why. Approximately how many bottles are needed to a. create this new edge? Image 1 4. Abel played another game (see Image 3). Show at least three other ways Abel can calculate his total score. 0000000 00000000 5. Omarion played another game (see Image 4). Show at least three 8 other ways Omarion can calculate his total score. KEY 0 0 Image 2 Abel's Game Omarion's Game 10 rings 10 rings X00X0000 0 0 **X** 0 0 **X** 0 0 represents one ring represents one ring 0000 OXO 0002000 x 100,000) + ( 00 x 10,000) + (\_\_\_x 1,000) + (\_\_\_x 100) $\odot$ X X 00 $(1 \times 100,000) + (2 \times 10,000) + (3 \times 1,000) + (4 \times 100)$ OX OX C $\mathbf{OOOO}$ 123,400 points 00×00 000 $\mathbf{O} \mathbf{O} \mathbf{O}$ OXXOC XO OX 0 O 0 0 $\bigcirc$ $\bigcirc$ OX OOOOO Fill in the blanks with the correct value 00000000 000000000 0000000

Image 3

Image 4