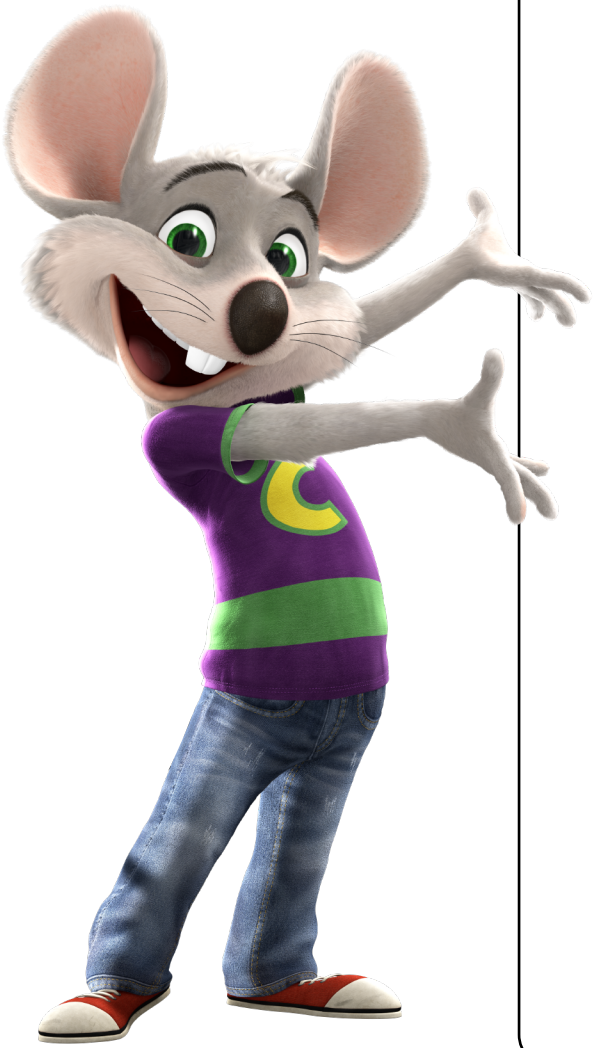
# TEACHER GUIDE

## Pre-Visit Activity
## Exploring Pushes and Pulls at Chuck E. Cheese

Chuck E.'s STEAM-tastic adventure

**Grade Level:** Kindergarten & First Grade
**Duration:** 45 minutes
**Location:** Classroom



## INTRODUCTION:

Why do some arcade games require players to push buttons, while others involve pulling a lever? What is the advantage of understanding how push and pull forces impact gameplay? Using an elementary-based physics approach, students and teachers will explore practical applications of push and pull forces through the interactive experience of arcade gaming.

Arcade games are accessible to players of all skill levels because they provide instant feedback (such as earning points or completing levels) while also challenging players to refine their skills over time. The physics behind game mechanics—including force, resistance, friction, and energy transfer—illustrates key concepts from math and science that are easily relatable to young learners.

The arcade gaming industry recognizes that science, technology, engineering, and mathematics (STEM) are essential to many fields and are increasingly being integrated into elementary education. By examining the forces at play in arcade games—such as pushing a pinball plunger, pulling a joystick, or striking a punching bag machine—Chuck E.'s STEAM-tastic Adventure provides a fun and academically enriching addition to STEAM learning, increasing cross-curricular opportunities and engagement.

Through this program, educators can introduce science terminology and literacy skills while reinforcing physics concepts in a fun, engaging way. Students will encounter cross-curricular learning opportunities, blending play with academics.

This guide ensures a structured yet interactive approach to teaching energy concepts in a way that excites and prepares students for hands-on learning at Chuck E. Cheese!

## OBJECTIVE:

Introduce students to the fundamental concepts of forces, specifically pushes and pulls, through an engaging, hands-on activity. This lesson will help students build a foundational understanding of how objects move, preparing them for further exploration during their visit to Chuck E. Cheese.

**Understanding Forces:**

### PUSHES AND PULLS

- A **force** is a push or a pull that causes an object to move, stop, or change direction.
  - Forces can be strong or weak, and the amount of force used affects how fast or far an object moves.
  - Gravity is another force that affects movement, pulling objects toward the ground.
- **Push:** A force that moves an object away from the source of force (e.g., kicking a ball, pushing a door open).
- **Pull:** A force that brings an object closer to the source of force (e.g., pulling a rope, dragging a suitcase).

**Materials Needed:**

- Small objects (e.g., toy cars, balls, blocks, or empty boxes)
- String or yarn (for pulling activities)
- Ramp (a piece of cardboard or a binder propped at an angle)
- Large sheet of paper or whiteboard for charting observations
- Markers for recording student responses

## ACTIVITY STEPS:

### 1. INTRODUCTION TO FORCES (5-10 minutes)

Force is a push or a pull that makes things move or stop! Imagine you're playing with a toy car. If you push the car, it goes forward. That's a force! Or if you pull on a wagon, it moves towards you. That's also a force.

When you kick a ball, you're using a force to make it roll, and when you stop it with your foot, you're using a force to make it stop. Force is just something that helps things start moving or helps them stop!

- **Begin with a discussion:**
  - Ask students: "What makes things move? How can you make something stop or go faster?"
  - Introduce the concept of forces, explaining that a push moves an object away while a pull brings an object closer.
  - Give real-life examples: pushing a swing, pulling open a door, kicking a ball.
  - Use body movements to demonstrate: Have students act out a push (pushing themselves up) and a pull (pulling an imaginary rope).

Chuck E.'s STEAM-tastic adventure

## 2. HANDS-ON EXPLORATION (15-20 minutes)

▸ **Push Experiment:**

- Provide each student or group with a small toy car or ball.
- Have them push the object gently and then harder.
- Ask guiding questions: “What happens when you push softly? What happens when you push harder?” Encourage students to describe their observations.

💡 *Did you know? Pushing a shopping cart is easy when it's empty, but when it's full, you need a stronger push!*

▸ **Pull Experiment:**

- Tie a string to a small object (such as a toy car or small box).
- Have students pull the object toward themselves.
- Ask: “How does pulling the string change how the object moves?” Discuss how different amounts of force affect movement.

💡 *Did you know? When you pick a flower from a garden, you’re using a force to bring it closer!*

▸ **Ramping Up the Fun:**

- Set up a ramp and have students place an object at the top.
- Ask: “What do you think will happen if we push the car from the top?”
- Test different levels of force and compare distances traveled.
- Encourage students to record their predictions and results.
- Discuss how gravity influences the movement of objects down the ramp.

💡 *Did you know? Sliding down a slide is like a push from gravity! Gravity is a force that pulls you down to the ground.*

## 3. OBSERVATION AND DISCUSSION (10 minutes)

▸ **Creating a Push & Pull Chart:**

- Draw a simple two-column chart labeled "Push" and "Pull" on your large paper or white board.
- Have students list examples from their experiments under each category.

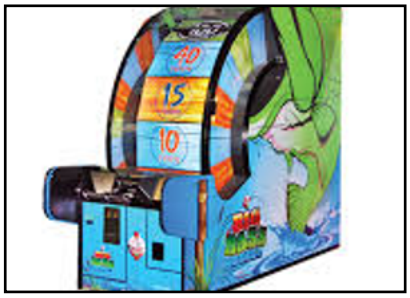
▸ **Discussion Questions:**

- “How did the strength of the push or pull change the movement?”
- “Where else in real life do you use pushes and pulls?” (e.g., pushing a shopping cart, pulling a suitcase, pushing buttons, pulling a rope)

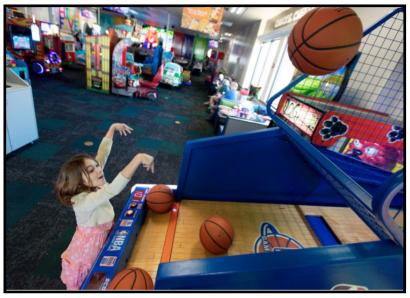
## 4. CONNECTING TO THE FIELD TRIP (5 minutes)

▸ **Explain how Chuck E. Cheese games involve pushes and pulls:**

- **Pushing** buttons on arcade games



- **Pulling** a lever on a Spin Wheel game



- **Throwing** a basketball in a Hoops game

- Encourage students to think about how they will use these forces at the arcade and predict which games will require a push or pull.
- "When we visit Chuck E. Cheese, pay attention to how you move objects. Which games require a strong push? Which ones need a gentle pull?"

▸ **Outcome:**

Students will develop a hands-on understanding of pushes and pulls, recognizing these forces in everyday life. This activity will create excitement for their field trip, where they will apply their learning in a fun and interactive way.

▸ **Extension Ideas:**

- **Home Challenge:** Have students find one push and one pull action at home and report back.
- **Creative Writing:** Ask students to write a short story about a day when everything could only be pushed or only be pulled.
- **Art Connection:** Draw a picture of a favorite game at Chuck E. Cheese and label where pushes and pulls happen in the game.

**Teacher Notes:** Adapt this lesson for different age groups by modifying the discussion depth and hands-on exploration complexity.

▸ **Vocabulary:**

| Term | Definition |
|---|---|
| **Force** | *A push or pull that makes an object move, stop, or change direction.* |
| **Push** | *A force that moves something away from you.* |
| **Pull** | *A force that brings something closer to you.* |
| **Gravity** | *A natural force that pulls objects toward the ground.* |
| **Friction** | *A force that slows or stops movement when two surfaces rub against each other.* |
| **Motion** | *The act of moving from one place to another.* |
| **Speed** | *How fast or slow an object moves.* |
| **Ramp** | *A sloped surface used to help objects move from one height to another.* |
| **Prediction** | *A guess about what will happen based on observations.* |
| **Observation** | *Using your senses to notice and describe what happens during an experiment.* |