



# **Fifth Grade Science**



## 5<sup>th</sup> Grade Science: Summer Activity 4

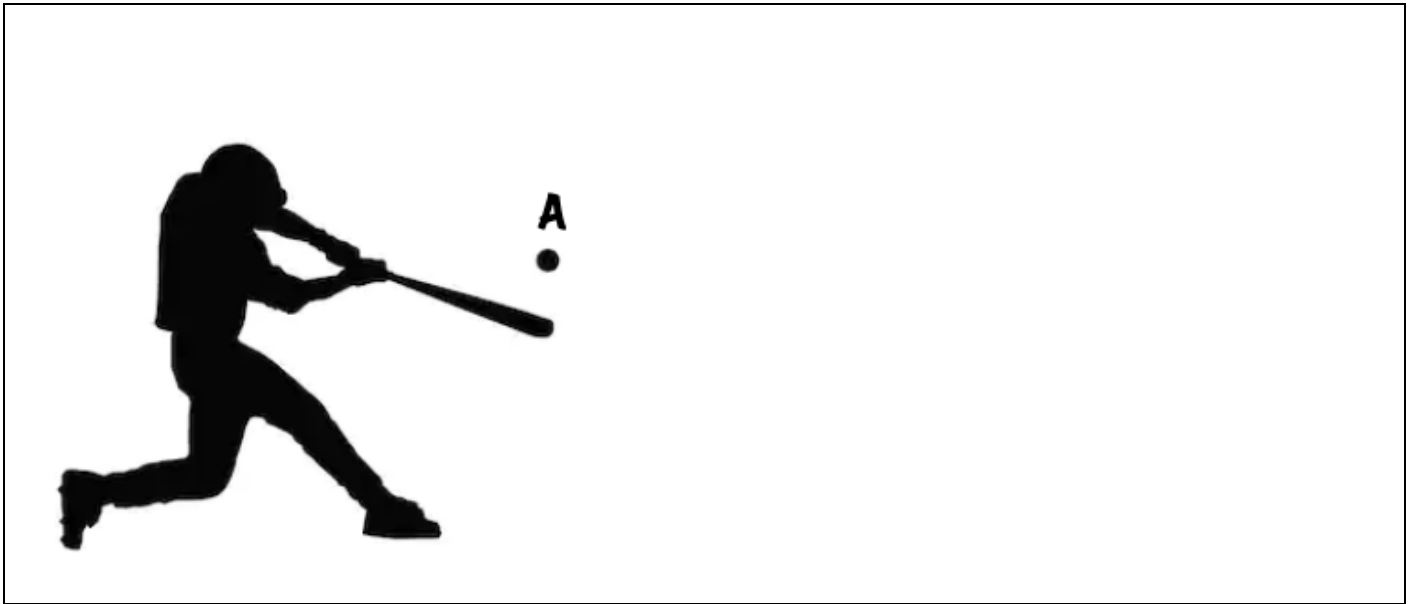
### How does distance affect gravitational pull?

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**Directions:** This handout goes with a KCS Teacher Video. If you have access to the video, watch the video before doing this activity. Read below with your child.

#### Activity One:

Look at the image below. Observe the movement in the image. Look at object A. Add arrows to show the direction the object will move. Will the object stop moving? Be sure to include this detail in your illustration.



What caused object A to move like this? Explain your ideas below.

# What Is Gravity?

Gravity pulls all sizes of objects together. The strength of the pull of gravity is affected by the total mass of the two objects and the distances between them. The pull of gravity decreases when the total mass of the two objects decreases and when the objects are further apart. Two objects do not have to touch each other to produce a force of gravity between them. The pull of gravity between Earth and the Sun acts across about 150 million kilometers (93 million miles) of space.

If gravity was the only force acting on a planet, the planet would be pulled into the Sun. What prevents this from happening? All objects have a property called inertia. This is the tendency of a moving object to keep moving in a straight line. The combination of gravity and inertia acting on space objects determines the path of their orbit.

## Activity Two:

How do gravity and inertia affect the movement of objects in space? You will use a ball and string to simulate the role of gravity and inertia between the Sun and Earth.

Materials Needed: tennis ball, 1.5 meters of string, enough cloth to cover the ball

Procedure:

1. Wrap the cloth around the ball. Pull the corners of the cloth together and tie them in a knot.
2. Securely tie the string to the cloth at the knot.
3. Stand away from other people, and slowly spin the ball in a circle.
4. Let go of the string. Be sure no people are in the way.

5. What happened when you let go of the string? \_\_\_\_\_  
\_\_\_\_\_

6. While swinging the ball, what did you feel happening between the string and your hand? \_\_\_\_\_  
\_\_\_\_\_

7. How does this activity model the interaction between the Sun and Earth?  
\_\_\_\_\_  
\_\_\_\_\_

8. In the left box, draw a diagram of you swinging the ball in a circle. Use arrows to indicate the directions of the two forces involved. In the right box, draw a second diagram of Earth orbiting the Sun. Use arrows to indicate the directions of the two forces involved.

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9. When does the force of gravity between two objects decrease?

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