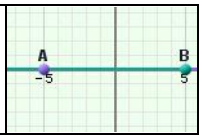
Name: _____ Date: _____ Period: _____ Page: _____

Gravitational Force Continued

Activity B: **Gravity and distance**	Get the Gizmo ready: • Turn on **Show distance**. • Set $\mathbf{m_A}$ and $\mathbf{m_B}$ to 10.0×10^5 kg.	

Question: How does distance affect the strength of gravitational force?

1. Form hypothesis: How do you think the distance between objects **A** and **B** will affect the strength of the gravitational force between them? _____

   _____

2. Predict: How do you think the gravitational force between two objects will change if the distance between the objects is doubled? _____

3. Measure: Place object **A** on the ***x*** axis at -5 and object **B** on the ***x*** axis at 5.

   A. What is the distance between the two objects? _____

   B. What is the magnitude of the force on object **A**? $|\mathbf{F_A}|$ = _____

4. Gather data: For each set of locations listed below, record the distance and the force on object **A**. **Leave the last column (Force Factor) blank for now.**

Object A	Object B	Distance (m)	$\lvert F_A \rvert$ (N)	Force factor
(-5, 0)	(5, 0)			
(-10, 0)	(10, 0)			
(-15, 0)	(15, 0)			
(-20, 0)	(20, 0)			

5. Interpret: How does increasing the distance affect the force? _____

   _____

6. Calculate: To calculate the force factor, divide each force by the original force (0.667 N). Write each force factor with three significant digits.

Activity B (continued from previous page)

7. Apply: What would you expect the force to be if the distance was 50 meters? _____

   Use the Gizmo to check your answer.

8. Make a rule: What happens to the force between objects as the distance between them increases?

   _____

   _____

9. Summarize:

   1. Name the two factors that affect the force of gravity:

      Factor A: _____ Factor B: _____

   2. Explain how the magnitude of gravitational force changes when Factor A increases:

   _____

   _____

   3. Explain how the magnitude of gravitational force changes when Factor A decreases:

   _____

   _____

   4. Explain how the magnitude of gravitational force changes when Factor B increases:

   _____

   _____

   5. Explain how the magnitude of gravitational force changes when Factor B decreases:

_____

_____