Name _____ Date _____

Soft Landing

Activity 1. Researching Forces and Cushioning Landing Systems

Cushioning landing systems are necessary to safely land exploration vehicles on the surface of planets and other objects in space. Your challenge is to build a soft-landing system for a raw egg.

While you work on your soft-landing system design, keep records by writing down your ideas, drawing your design, or taking pictures. Engineers document their work as they design solutions.

Use the Internet or library resources to learn more about force, motion, and materials and methods used to cushion impact. Then answer the following questions.

1. What are three forces you must account for in designing your soft-landing system?

_____

_____

2. What is the relationship between acceleration and speed?

_____

_____

_____

Activity 2. Designing and Building a Soft-Landing System

Your teacher will tell you what materials you can use. Think about what you must build. Then begin exploring how to build with your materials.

Answer the following questions to help you think about your design.

1. What types of materials and methods were used in the design of the Mars exploration rover landing system? Would you use any of these methods in the design of your soft-landing system? Why or why not?

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2. What materials do you plan to use to construct your soft-landing system? Why?

_____

_____

_____

_____

3. Draw a detailed diagram of your soft-landing system design in the space provided below. Be sure to use labels to point out what materials you will use for each part of your design. Explain how you will put your materials together.

Name _____ Date _____

Activity 3. Testing the Soft-landing System and Communicating Results

Your teacher will help you test the ability of your soft-landing system to protect its egg cargo. Before you test it, be sure to record what you finally built by drawing or taking a picture of your design. Review your notes, too. If they're good, someone else should be able to follow them to build a matching soft-landing system.

After testing your soft-landing system, answer the following questions.

1. Height soft-landing system dropped from: _____

2. Describe the condition of your egg after the drop. Did your egg survive the fall?

_____

_____

3. What materials or construction methods were most successful?

_____

_____

_____

4. What materials or construction methods were least successful?

_____

_____

_____

5. If you were to construct another soft-landing system, how would you improve your design? In your answer, explain why you might change the materials or construction methods you used.

_____

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