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Mousetrap Cars Worksheet

ACTIVITY SUMMARY

You will individually design, build, and test a mousetrap car design and apply the Engineering Design Process (EDP) as you complete this design challenge.

STUDENT LEARNING OBJECTIVES

After this activity, you will be be able to:

- Understand and apply the Engineering Design Process (EDP)
- Describe how the EDP is used at each step of the mousetrap car design challenge
- Explain how their mousetrap car functions
- Improve on the mousetrap car design by iterating the EDP

Materials

The following **materials** will be provided. You may bring in other materials to use with teacher approval.

• 1 mousetrap	• 2 BBQ skewers
• 10 craft sticks	• 2 straws
• 36” fishing line	• Unlimited cardboard
• Maybe 2 sticks hot glue and hot glue gun	• Unlimited duct tape

Ask

1. In your own words, describe the **problem** you are trying to solve **or goal** of the mousetrap car activity? **Write your response in at least 3 complete sentences**.

What are the **constraints (limits)** of the mousetrap car design challenge that you need to consider?

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Research

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2. **Research different design ideas for building your mousetrap car.**
   To start, watch the recommended research videos and visit the recommended websites:

Recommended Research Videos:	**Recommended Websites:**
• tinyurl.com/mousetrapcarvideo1 • tinyurl.com/mousetrapcarvideo2 • tinyurl.com/mousetrapcarvideo3 • tinyurl.com/mousetrapcarvideo4	tinyurl.com/mousetrapcarwebsite1 tinyurl.com/mousetrapcarwebsite2 tinyurl.com/mousetrapcarwebsite3

- Use the internet (Google, YouTube, Google images) to research mousetrap car design ideas.
- As you research different mousetrap car designs, find three images of car designs that you like and explain why you think each one is good in terms of the car's build and the materials used.
- After you complete the following table, share your design ideas with a thought partner.

(Copy and paste design image here)	(Explain why this is a good design idea)
(Copy and paste design image here)	(Explain why this is a good design idea)
(Copy and paste design image here)	(Explain why this is a good design idea)

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Brainstorm

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3. **Sketch at least two mousetrap car prototypes** (initial designs) that are possible ideas that you may build. Make sure to label the materials you are considering using in each design.

- Which materials may be used for the car body, wheels, axles, etc.?

- How will the axles and wheels be attached to the car body?

- What materials may be used to power the car?

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Plan

4. **Decide on and draw the final design of the mousetrap car that you will build and test.**

   Mousetrap Car Final Design ******SKETCH AND LABEL YOUR DRAWING*** *with each car part and the materials and quantities used to build your car's design****

Review and list the type and amount of materials to build each part of your mousetrap car:

a. **Material(s) to build the car body of the car, axles, wheels, etc.:**

b. **Material(s) will be used to attach the axles and wheels to the car body:**

c. **Material(s) used to power the car:**

d. **Other parts and materials needed:**

Create

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5. **Build a prototype (first model) of a mousetrap car according to your final design in the previous section.**

    a. What **worked well** in building your mousetrap car? **Write your response in at least 3 complete sentences**

    b. What **challenges** did you experience while building your mousetrap car? **Write your response in at least 3 complete sentences**.

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Test

6. **Test your mousetrap car prototype to see how far it can travel.** For three trials, measure the distance in cm or m that your car traveled. Next, determine the average distance that your mousetrap car traveled in cm or m.

Trial	Distance traveled (cm or m)
1	
2	
3	
Average Distance Traveled (0.00) (add all three distances and divide by 3 to find the average distance traveled)	

   a. Did your mousetrap car travel far or not? Explain what worked well and what didn't work well in your car design. **Write your response in at least 3 complete sentences**.

   b. What **modifications** (changes) do you want to make to your mousetrap car design? How do you expect that will affect your mousetrap car performance? **Write your response in at least 3 complete sentences**.

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Improve

7. **Modify (iterate) your mousetrap car design by changing the model to make it better.**

   a. Describe the **iteration** (new version) of your mousetrap car and explain why you made these changes. **Write your response in at least 2 complete sentences**.

   b. **Retest your new mousetrap car design three more times.** Measure how far your car travels in cm or m. Find the average distance traveled after three trials.

Trial	Distance traveled (cm or m)
1	
2	
3	
Average Distance Traveled (0.00) (add all three distances and divide by 3 to find the average distance traveled)	

   c. Did your improved mousetrap car design travel farther or not? Explain what worked well and what didn't work well in your car design. **Write your response in at least 2 complete sentences**.

   d. Based on the retest results, what further modifications would you make to your car design and why? **Write your response in at least 2 complete sentences**.