

## Team Members:

1. \_\_\_\_\_ 3. \_\_\_\_\_

2. \_\_\_\_\_ 4. \_\_\_\_\_

### Total Points

Workbook: ..... /4 pts

Challenge: ..... /25 pts

## Exploring Linear Motion

**Instructions:** Write the correct answer in the spaces provided.

1. \_\_\_\_\_ is motion that moves in a straight line.

**Instructions:** Place a check in each box as each step is completed.

 2.  As a team, discuss and/or research real-world examples of linear motion. Write down two examples in the spaces provided below.

a. \_\_\_\_\_

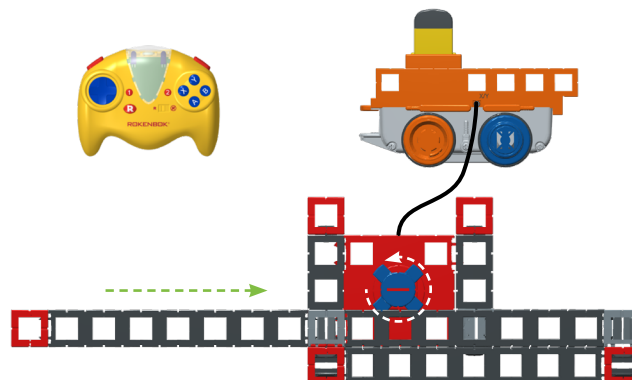
b. \_\_\_\_\_

 3.  Assemble a mechanism that converts rotary motion to linear motion.  
*Curriculum Packet - Pages 2 - 3*

 4.  Activate the mechanism and observe how it converts rotary motion to linear motion.

### Linear Motion

- Moving in a straight line -



## Design & Engineering Challenge

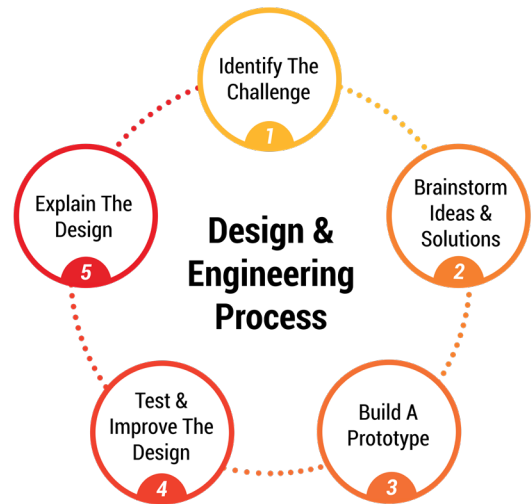
Follow each step in the design & engineering process to develop a solution to the challenge. Place a check in each box as each step is completed. Fill in the blanks when necessary.

### 1. Identify The Challenge

Challenge: \_\_\_\_\_

### 2. Brainstorm Ideas & Solutions

- Discuss design ideas.
- Consider building components.
- Sketch out design ideas on paper.
- Choose the best design.



### 3. Build A Prototype

Use Kid Spark engineering materials to build a prototype.

### 4. Test & Improve The Design

- Look for opportunities to improve the design. (Is it practical, proportional, etc..)
- Review challenge specifications/criteria and grading rubric.

### 5. Explain The Design

- Determine the specifications of the design that was created. *Student Engineering Workbook - Page 3*
- Discuss the following items with your team and be prepared to share with the rest of the class.

- a. How did the team arrive at the final design solution? Discuss how each step in the Design & Engineering process was used to develop the design.
- b. Is the design realistic and well-proportioned?
- c. How did each team member contribute towards the overall design? Do you feel like everyone had an equal opportunity to contribute in the creative process?
- d. Is the team prepared to share detailed specifications of the design to others?

## Design Specification

Determine the specifications of the completed design/project. Teams can use these specifications as they prepare to present their design to others.

**Product Innovation/Invention:** \_\_\_\_\_

**Purpose:** \_\_\_\_\_

### Engineering Notes:

(How does the design work? Are there any key engineering materials that make the design function well?)

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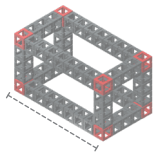


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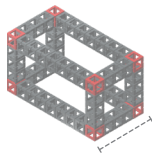
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### Project Dimensions



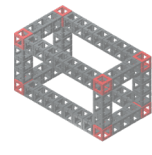
Length

\_\_\_\_\_ cm



Depth

\_\_\_\_\_ cm



Height






\_\_\_\_\_ cm

### Cost Analysis

Engineering materials used: \_\_\_\_\_ x 2 = Total Cost \$ \_\_\_\_\_

## Challenge Evaluation

When teams have completed the design & engineering challenge, it should be presented to the teacher and classmates for evaluation. Teams will be graded on the following criteria:

-  **Design and Engineering Process:** Did the team complete each step of the design and engineering process on page 2?
-  **Design Specification:** Did the team complete the design specification on page 3?
-  **Team Collaboration:** How well did the team work together? Can each student describe how they contributed?
-  **Design Quality/Aesthetics:** Is the design of high quality? Is it structurally strong, attractive, and well proportioned?
-  **Presentation:** How well did the team communicate/explain all aspects of the design to others?

Grading Rubric	Advanced 5 Points	Proficient 4 Points	Partially Proficient 3 Points	Not Proficient 0 Points
<b>Design &amp; Engineering Process</b>	<input type="checkbox"/> Completed all 5 steps of the process	<input type="checkbox"/> Completed 4 steps of the process	<input type="checkbox"/> Completed 3 steps of the process	<input type="checkbox"/> Completed 2 or fewer steps of the process
<b>Design Specification</b>	<input type="checkbox"/> Complete/well-detailed and of high quality	<input type="checkbox"/> Complete/opportunities for improvement	<input type="checkbox"/> Incomplete/opportunities for improvement	<input type="checkbox"/> Incomplete
<b>Team Collaboration</b>	<input type="checkbox"/> Every member of the team contributed	<input type="checkbox"/> Most members of the team contributed	<input type="checkbox"/> Few members of the team contributed	<input type="checkbox"/> Team did not work together
<b>Design Quality/Aesthetics</b>	<input type="checkbox"/> Great design/great aesthetics	<input type="checkbox"/> Good design/good aesthetics	<input type="checkbox"/> Average design/average aesthetics	<input type="checkbox"/> Poor design/poor aesthetics
<b>Presentation</b>	<input type="checkbox"/> Great presentation/very well explained	<input type="checkbox"/> Good presentation/well explained	<input type="checkbox"/> Poor presentation/poor explanation	<input type="checkbox"/> No presentation/no explanation
<b>Points</b>	.....	.....	.....	.....
<b>Total Points</b>				...../25