

Team Members:

 1. _____ 2. _____

Total Points

Workbook: /10 pts

Challenge: /20 pts

What is Area?

Fill in the blanks in the statement below.

1. _____ is the amount of two-dimensional space taken up by an object. Area is measured in _____ of a fixed size, such as square inches (in²) or square centimeters (cm²).

Assemble a Square, Rectangle, and Circle

Place a check in each box as each step is completed.

2. Assemble a **square** using Kid Spark engineering materials.
3. Assemble a **rectangle** using Kid Spark engineering materials.
4. Assemble a **circle** using Kid Spark engineering materials.

Determine the area of Squares, Rectangles, and Circles

Fill out the correct information in the spaces provided.

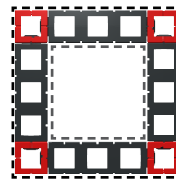
 5. **Area** of entire **square**: _____ cm²

 6. **Area** of interior **square**: _____ cm²

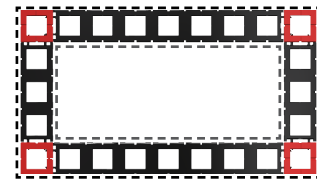
 7. **Area** of entire **rectangle**: _____ cm²

 8. **Area** of interior **rectangle**: _____ cm²

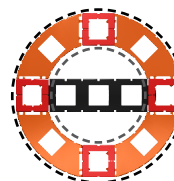
 9. **Area** of entire **circle**: _____ cm²

 10. **Area** of interior **circle**: _____ cm²


Square



Rectangle



Circle

Design & Engineering Challenge

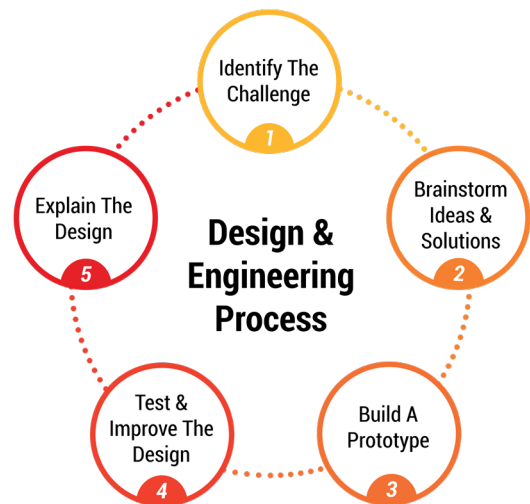
Follow each step in the design & engineering process to develop a solution to the challenge. Place a check in each box as each step is completed. Fill in the blanks when necessary.

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? Is the large room big enough to store a Maker ROK-Bot? Is there enough room to walk around the Maker ROK-Bot when it's inside the building?
- 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 Specifications

Use the space provided to determine the area of the large and small rooms in the storage building.

Large Room





Total area of large room: _____ cm²

Small Room

Total area of small room: _____ cm²

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:

-  **Specifications:** Does the design meet all specifications as stated in the design brief?
-  **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 all aspects of the design to others?

Grading Rubric	Advanced 5 Points	Proficient 4 Points	Partially Proficient 3 Points	Not Proficient 0 Points
Specifications	<input type="checkbox"/> Meets all specifications	<input type="checkbox"/> Meets most specifications	<input type="checkbox"/> Meets some specifications	<input type="checkbox"/> Does not meet specifications
Team Collaboration	<input type="checkbox"/> Every member of team contributed	<input type="checkbox"/> Most members of team contributed	<input type="checkbox"/> Some members of team contributed	<input type="checkbox"/> Team did not work together
Design Quality/ Aesthetics	<input type="checkbox"/> Great design/ aesthetics	<input type="checkbox"/> Good design/ aesthetics	<input type="checkbox"/> Average design/ aesthetics	<input type="checkbox"/> Poor design/ aesthetics
Presentation	<input type="checkbox"/> Great presentation/ well explained	<input type="checkbox"/> Good presentation/ well explained	<input type="checkbox"/> Poor presentation/ explanation	<input type="checkbox"/> No presentation/ explanation
Points
Total Points /20			