

# MAKER JOURNAL

Name: \_\_\_\_\_

Date: \_\_\_\_\_

How do musicians carry their instruments? How do pirates carry their bounty? Can you think of some examples of **carrying cases**?

List or draw examples of carrying cases.

*Egg cartons for carrying eggs.*

Think about carrying cases you use daily at school. How is each **designed** to **protect** and **fit** what is inside?

Case	How does the design protect what is inside?	How is the case designed to fit what is inside?
<i>Pencil box</i>	<i>It's made from hard plastic, and clips shut so the pencils won't fall out.</i>	<i>It is a little longer than an average pencil.</i>

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**Draw your object. Add a description or labels as you wish.**

*Record feedback from a friend.*

<b>What do you like about my object?</b>	<b>What could change?</b>

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How might you measure your food, hand, or arm using an item in your class as a measuring tool. Try measuring different objects using what you find in your space as a measuring tool. Think creatively. Do not use rulers. Fill in the chart below.

Measuring tool	Objects you measured	Measurement
<i>Bottle cap</i>	<i>forearm</i>	<i>10 bottle caps</i>
	<i>desk</i>	<i>21 bottle caps</i>
	<i>pinky</i>	<i>1 <math>\frac{1}{2}</math> bottle caps</i>

Think about your measuring tools. What worked well for each? What were some challenges?

Measuring tool	What worked well?	Challenges
<i>Bottle cap</i>	<i>It was easy to move around, and</i>	<i>It rolled away, and was</i>
	<i>I had a whole bunch that I</i>	<i>sometimes hard to line up</i>
	<i>could line up and count.</i>	<i>because it's round.</i>



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Measure objects in your classroom using standard measuring tools.

Measuring tool	Objects you measured	Measurement
<i>Ruler</i>	<i>forearm</i>	<i>8 inches</i>
	<i>desk</i>	<i>24 inches</i>
	<i>pinky</i>	<i>1 <math>\frac{1}{2}</math> inches</i>

Make your own measuring tool to measure the object you built. Your tool must have standard units (inches/centimeters...). Mark these units on your tool.

What standard unit will you use?	What material will you use to make your measuring tool?	How will you mark units on your measuring tool?
Inches	Ribbon	With a marker and a ruler

**Draw and label your measuring tool.**

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*How will you test each material for strength, durability, flexibility, and whether or not it can be modified?*

Test for Strength	Test for Durability
<ul style="list-style-type: none"> <li><i>With 2 people holding the edges, can it hold up 3 dictionaries?</i></li> </ul>	
Test for Flexibility	Can it be changed/modified?

*Test different materials and record your findings below.*

<b>Material</b>	<i>Stretchy fabric</i>
<b>Strength</b>	<i>It held up 5 dictionaries</i>
<b>Durability</b>	<i>It can get wet, and snags when rubbed on the floor for 1 minute</i>
<b>Flexibility</b>	<i>It doesn't change when bent, rolled, or tied up</i>
<b>Modification</b>	<i>It can be cut with scissors. Tape and school glue do not work with this.</i>
<b>Material</b>	
<b>Strength</b>	
<b>Durability</b>	
<b>Flexibility</b>	
<b>Modification</b>	

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<b>Material</b>	
<b>Strength</b>	
<b>Durability</b>	
<b>Flexibility</b>	
<b>Modification</b>	
<b>Material</b>	
<b>Strength</b>	
<b>Durability</b>	
<b>Flexibility</b>	
<b>Modification</b>	

*Make a plan for the materials you will use to build a carrying case, and how much of each you will need.*

**Draw and label or list your materials.**

**Draw and label or list the tools you will need.**

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*Sketch your carrying case. Label the materials you will use, as well as the specific measurements of your case.*

**Draw your carrying case.**

### ***Criteria (design requirements)***

- *Case must protect the object from a fall*
- *Case must protect the object from a weight resting atop the case, for a minute*
- *Case is easy to carry with one hand*
- *Case is reusable; object can be removed and replaced*

### ***Constraints (design limitations)***

- *Case must be built with materials provided*
- *Case must be completed and tested in the given time*
- *When testing, the object inside must remain unchanged*

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<i>Criteria (design requirements)</i>	<i>Constraints (design limitations)</i>
<ul style="list-style-type: none"> <li>• Case must protect the object from a fall</li> <li>• Case must protect the object from a weight resting atop the case, for a minute</li> <li>• Case is easy to carry with one hand</li> <li>• Case is reusable; object can be removed and replaced</li> </ul>	<ul style="list-style-type: none"> <li>• Case must be built with materials provided</li> <li>• Case must be completed and tested in the given time</li> <li>• When testing, the object inside must remain unchanged</li> </ul>

Can the case...		Notes
Protect your object from a <u>5</u> foot drop?	<input checked="" type="radio"/> Yes <input type="radio"/> No	The case was dented on the corner, but the object was fine.
<b>Test 1</b>		
Protect your object from a ___ foot drop?	Yes No	
Support a weight of _____ for 1 minute?	Yes No	
Be carried ___ feet with 1 hand?	Yes No	
Be reused __ times? Take the object out, and put it back.	Yes No	
Did the object stay the same?	Yes No	



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Can the case...		Notes
Test # _____		
Protect your object from a ___ foot drop?	<i>Yes</i> <i>No</i>	
Support a weight of _____ for 1 minute?	<i>Yes</i> <i>No</i>	
Be carried ___ feet with 1 hand?	<i>Yes</i> <i>No</i>	
Be reused __ times? Take the object out, and put it back.	<i>Yes</i> <i>No</i>	
Did the object stay the same?	<i>Yes</i> <i>No</i>	

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Test # _____		
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Be reused __ times? Take the object out, and put it back.	<i>Yes</i> <i>No</i>	
Did the object stay the same?	<i>Yes</i> <i>No</i>	