

Unit 1: Meet Technology

Lesson 1: Technology to the Rescue

Why do you need it?

Sketch a picture of something that you need or want, that is not a living thing, and that you could not live without.



Explain why you need the object in the picture.

Might others need the same object?

How would someone use the object in the same way you do to complete an everyday task?

How would someone use the object differently than you do to complete an everyday task?

How could this object be improved? Be prepared to share with the class and make a valid argument for the improved product as being the most wanted.

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Big Idea

Purpose of the lesson: This lesson demonstrates how technology's purpose is primarily to meet human needs and wants. As societies' needs change, so does technology, through creative innovation.

BIG IDEA for the lesson: Technology addresses our current wants and needs. Through innovation, humans have changed natural resources into products.

BIG IDEA In Your Words Write the big idea for the lesson in the blank below using your own words.



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Words to Know

	Definition	Example(s)
Technology		
Science		
Need		
Want		
Impact		
Society		
Product		
Innovation		

List the differences between science and technology on the chart below.

Technology	Science

Does technology have to be a product or tangible object? _____

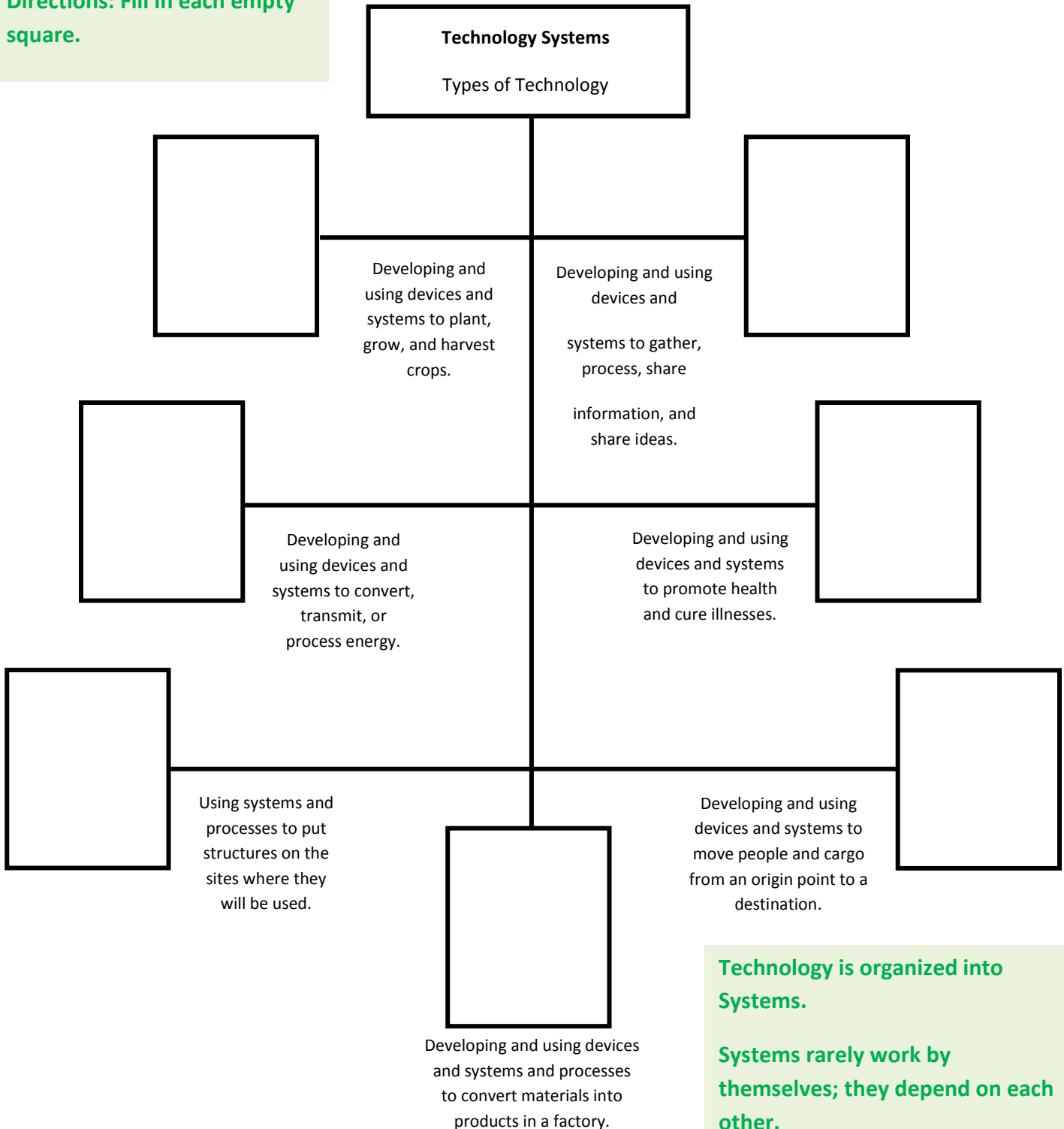
Why or Why not?

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Different but Still a Family – Technology System

Directions: Fill in each empty square.



Technology is organized into Systems.

Systems rarely work by themselves; they depend on each other.

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Product Example

Technology – Sorting Technologies Out

Directions: You are to find pictures of things that best represent technology. Sort the pictures into the 7 technology systems (At least 1 picture for each technology system). You may use computer software or cut and paste pictures from magazines. If using google docs or Word select an 11" x 17" piece of paper. Label each picture with the **Systems Name**. Under each picture explain **how** it is used and **why** it is important for society to have this technology and what **impact** it may have. Below is an example. Be creative it does not have to look exactly like this.

Technology Systems						
Medical						Information and Communication
Picture						Picture
How ...						How ...
Why ...						Why ...
Impact ...						Impact ...
	Transportation			Construction		
	Picture			Picture		
	How ...			How ...		
	Why ...			Why ...		
	Impact ...			Impact ...		
		Energy & Power				Ag and Biotechnologies
Manufacturing		Picture				Picture
Picture		How ...				How ...
How ...		Why ...				Why ...
Why ...		Impact ...				Impact ...
Impact ...						

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Sorting Technologies Out Activity Rubric

	Below Target	Moving to Target	At Target
Identifies Technology in proper category.	Cannot tell one technology from the other	Technologies are identified correctly most of the time	Correctly identifies all technologies
Explains How it is used.	Unclear or incorrect explanations	Explanations are correct most of the time	Use of technology correctly explained
Explains why it is important to society (what advantage does it give us)	Does not know how it is important to society	Explains why it is important to society most of the time	Explains why the technology is important to society.
Explains what impacts it may have on society.	Does not list or understand what impacts the technology may have.	Has some idea of how the technology impacts society.	Understands how technology impacts society.

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Introducing Technology Notes

Technology solves problems that could not have been solved without it.

Directions: Fill in the Blanks

Technology is:

- Not just _____.
- Developed out of a _____.
- _____
- _____ changing.
- Often done in _____.
- Often an _____ on pre-existing designs.

Impacts can be intended or _____.

Engineers take project ideas developed by _____ and _____ and produce solutions to be used

Directions: Respond to the Following

Name a product that would not exist without the use of a new technology and the impact it may have had. _____

Think of a technology that could not have been developed without science mathematics, and history. How have science, mathematics, and history contributed to the development or improvement of this technology? _____

Why do we need to think about the impacts technology might have? _____

Directions: Fill in the Blanks

Science contributes to the development of _____.

Mathematics makes sure technology is developed with _____ and _____.

History lets us know what technologies have or have not worked as well as the _____ they have had

QUIZ

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Lesson 2: System Design: What Every Technology Needs

Big Idea

BIG IDEA for the lesson: Technology is most useful when each facet of its creative design is carefully considered, such as its inputs, process, outputs, and feedback.

BIG IDEA In Your Words Write the big idea for the lesson in the blank below using your own words.



Unit 1: Meet Technology

Lesson 2: System Design: What Every Technology Needs

Words to Know

	Definition	Example(s)
System		
Input		
Process		
Output		
Feedback		
Society		
Product		
Innovation		

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Lesson 2: System Design: What Every Technology Needs

Assembly Line Activity

Activity Design Brief: Each person on your team will be given a job on an assembly line. There should be no talking among the workers except for the quality control people; they are allowed to talk to the workers. Complete the task given on your assembly line.

Reflection Questions:

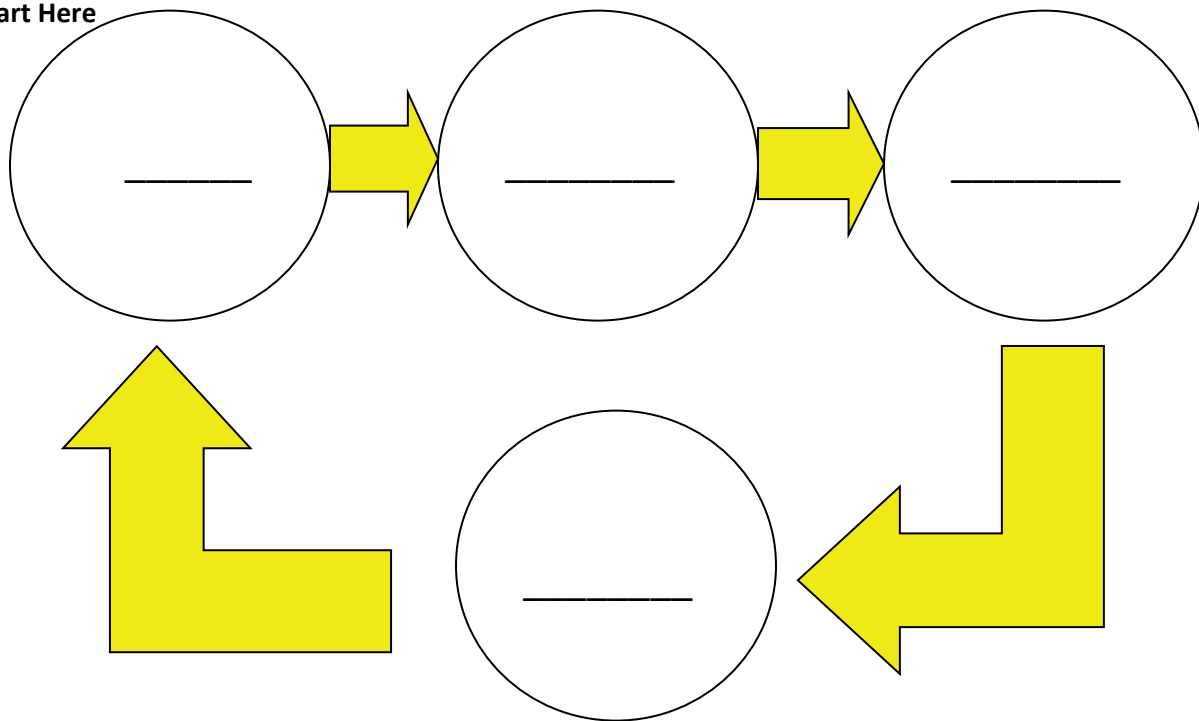
1. What mistakes were made during the manufacturing process?
2. How did the mistake affect the desired outcome of the final product?
3. Were the mistakes noticed before the product was finished?
4. What role did the quality control person have on the assembly line?
5. Do you think there would have been more or less mistakes without the quality control person?

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Lesson 2: System Design: What Every Technology Needs

The Loop System

Start Here



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Lesson 2: System Design: What Every Technology Needs

Resources of Technology

Resource	Examples

Unit 1: Meet Technology**Lesson 2: System Design: What Every Technology Needs****Rocket Design Brief**

A design brief is a written explanation, given to a designer, outlining the aims, objectives and milestones of a design project.

Design Problem: With the elimination of the space shuttle program in the early 2000s the National Space and Aeronautics Administration (NASA) has depended upon Russia to launch most of its flights into space using Russian space shuttles. With tensions rising in that region the U.S. government has decided it would be a good idea to reinvest in American space technology and design our own space vehicles.

Design Brief: As a recent engineering graduate you have been hired by NASA to design the next rocket NASA will use to deliver payloads into space. With the rising cost of fossil fuels and awareness of our environment NASA has asked you to design and create a working prototype of a water propelled rocket that will meet the following specifications and constraints.

Specifications and Constraints:

- The rocket must use water and compressed air as its fuel source.
- The rocket must use a **soda bottle** as its propulsion chamber (no other bottle type is acceptable as it will not handle the pressures required)
- Only a 2 liter, 1 liter, 20 ounce, or 16 oz. soda bottle may be used as a propulsion unit.
- The rocket should stay in the air as long as possible. *Think about how this can be achieved.*
- Nothing sharp that may cut someone may be used on the rocket.
- All parts of the rocket must remain attached to each other throughout the flight and landing.

Resources: NASA has created a list of potential resources you could use in your design.

Cardboard	Soda bottles	String	Compact Discs
Balsa wood	Water bottles	Plastic Bottles	Paper/Plastic Cups
Thick paper	Soup Cans	Cardboard Tubes	Tape
Plastic grocery bags	Fishing line	Modelling clay	Your Choice

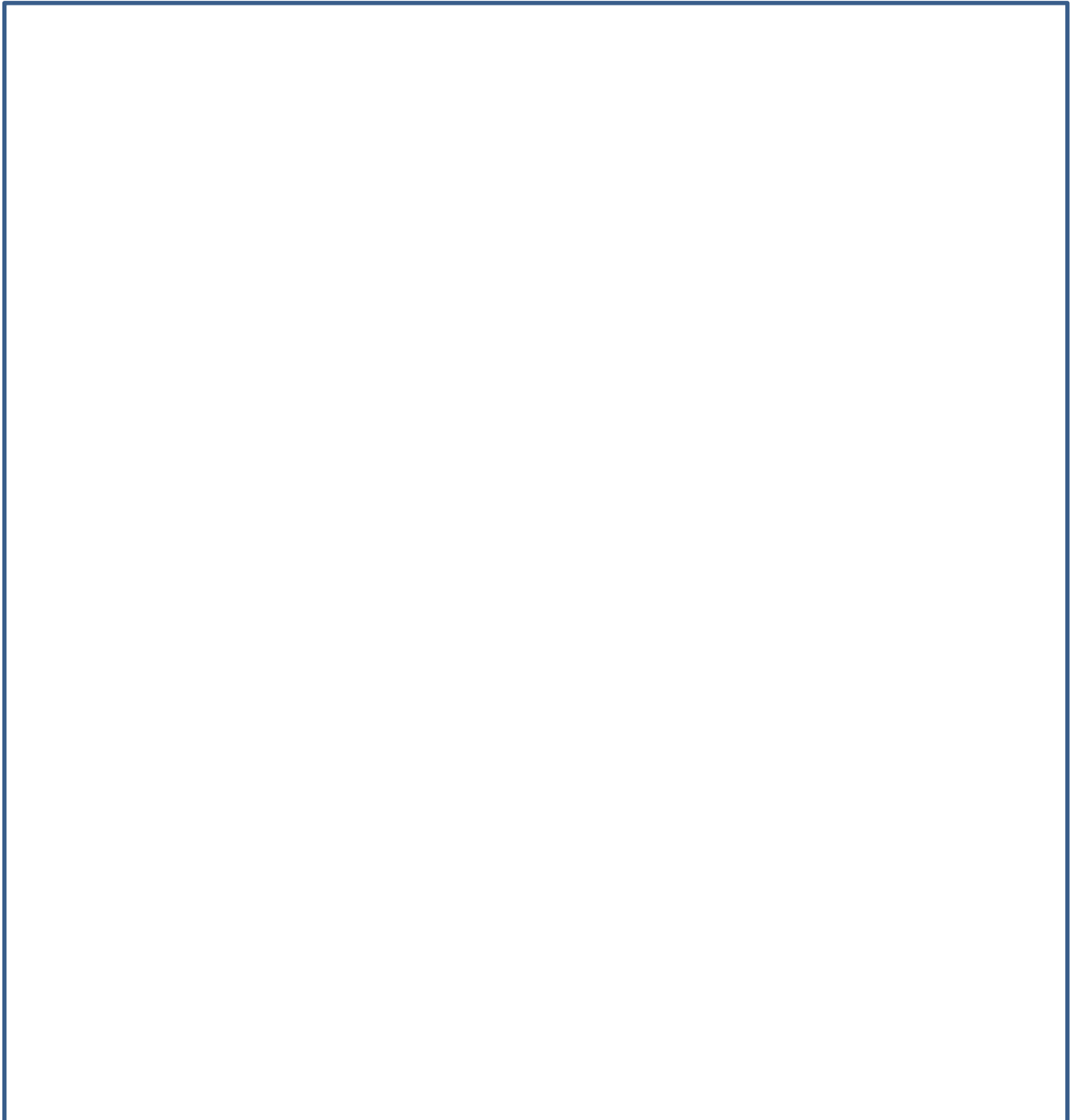
*****You are responsible for bringing in the resources required for this project. You can count on Mr. Page to have tape, glue, and cardboard.*****

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Lesson 2: System Design: What Every Technology Needs

Rocket Systems

Draw and label the systems of a rocket. See links on Mr. Pages' website.

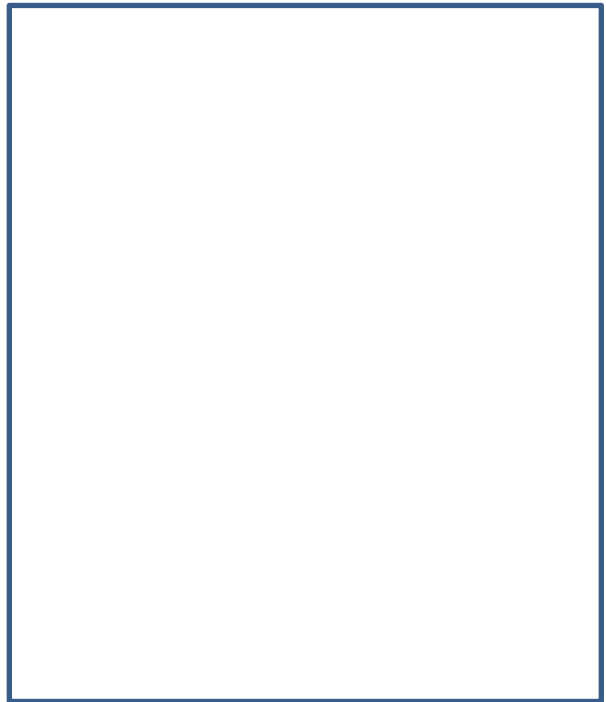
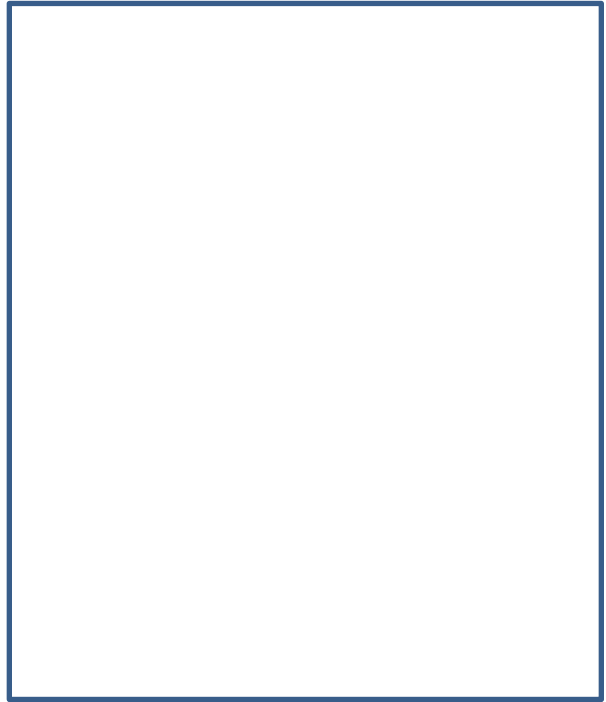



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Lesson 2: System Design: What Every Technology Needs

Rocket Design Rough Sketches

Directions: In the boxes below sketch some rough ideas of how you might build your rocket. Label the parts and materials used, for example, fins (cardboard).

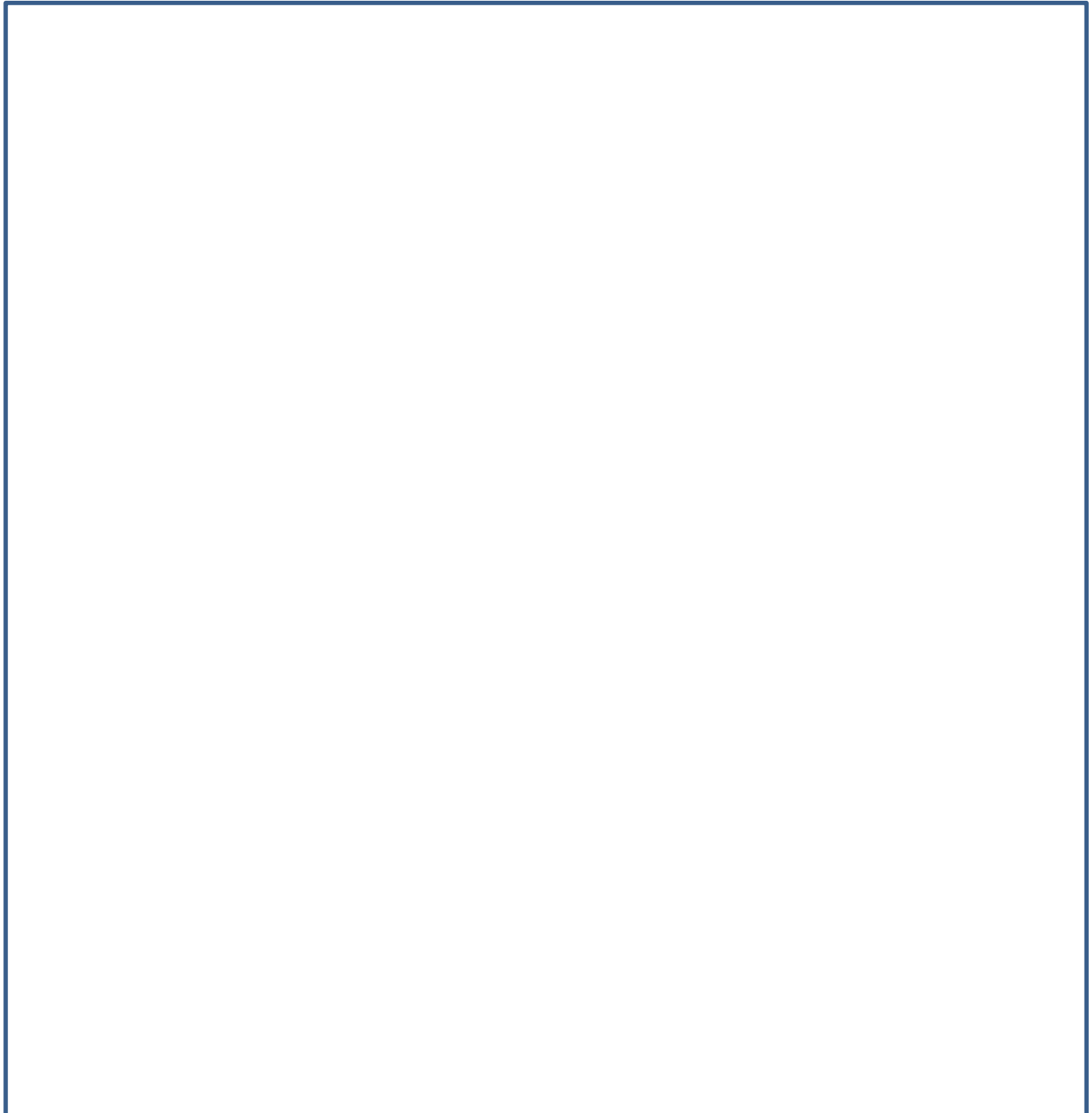


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Rocket Design Final Sketch

Directions: Pick the best ideas from the sketches above and create a final sketch in the box below. Remember to label all of the parts and materials in the sketch. Example fins made of cardboard.



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Rocket Activity Rubric

	Below Target	Moving to Target	At Target
Planning/Sketches	Sketches are missing or incomplete.	Sketches are present and contain most of the details required.	Sketches are present and contain all details required.
Resources	Little to no resources brought in.	At least two resources have been brought in to help the team complete the project.	A great deal of resources have been brought in to help the team complete the project.
Research	Research questions have been answered but with little research to back them up.	Research questions have been answered and are based on research.	Research questions have been answered and a high degree of research has been used to formulate the answers.
Manufacturing	A rocket has been built	A functional rocket has been built and some student research into how a rocket works is incorporated into the design.	A quality rocket has been built and a great deal of student research into how a rocket works is incorporated into the design.
Function	Rocket is incapable of flight or has an extremely poor flight.	The rocket is capable of flight with some problems.	The rocket flight is highly successful.

QUIZ