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Period:	

WATERPROOF THE ROOF

UNIT: ENVIRONMENTAL AND AGRICULTURAL CONCEPTS

THE PROBLEM:

Develop a system of roofing to cover a miniature house and prevent water from leaking.

CONSTRAINTS:

- 1. Completely cover the top of the house.
- 2. Utilize no single pieces larger than 2 square inches.
- 3. Prevent any water from a 1-liter rainstorm from getting into the house.

MATERIALS:

- White craft fluffs
- Paper towels
- Twine
- Paper clips
- Card stock
- Tape
- TOOLS:
 - ✓ Measuring cup
 - √ Large bin (to place planter in)
 - ✓ Water
 - ✓ Scissors
- **DIRECTIONS:**

Be sure to check off each step \square as you progress.

- □ **Step#1** Read through the design brief.
- Step#2 Listen as your teacher reviews constraints, the materials, and specific testing procedures. If necessary, write down any additional constraints.

- Chenille pipe cleaners
- Foil
- Planter (the "house" to be protected from water)
- Twist ties



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Step#3 – Brainstorm some ideas for your roof. Write these ideas in the space provided. Discuss your
ideas with your group. Write down the materials you would need for your designs.
Step#4 – With your group, determine which idea you will use and sketch your final solution in the space provided. Write down the materials you will need.
Step#5 – Construct your roof.
Step#6 – Test your roof by placing it in the bin and pouring a liter of water over it.
Note: Follow your teacher's directions for testing.
Step#7 – If your roof leaks, discuss with your group what you need to do to make it better. Make and
write down your modifications then retest your design. Repeat this step until it works or until you reach
the number of trials allotted by your teacher.
Stant's Poad the reflection questions and write down your answers in complete conteness. Write a

Step#8 – Read the reflection questions and write down your answers in complete sentences. Write a

formal report addressing and answering the questions.



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GENERATE IDEAS

Draw pictures of your ideas here. Be sure to include the materials you expect to need to build your design!
Materials Required for Building:
Tracerials required for parially.



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FINAL SOLUTION

raw a picture of your group's final roof design here.	



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REFLECTION:

Answer the following questions in complete sentences. Write a formal report addressing and answering the questions.

- 1. How much did you feel your ideas impacted the final group design?
- 2. Did your group make revisions as you were building? If so, what?
- 3. Did you have any extra materials leftover that you thought you would need?
- 4. What would happen in a real construction job if there were leftover materials?
- 5. Did you test your roof at all during construction? If so, how did your roof fare?
- 6. Do you think engineers often change their original plans during the construction process?
- 7. What do you think this might do to their construction budget?



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GRADING RUBRIC

Effort /Tools	Desistant	Inches offers	A	Futancius offers.
Effort/Task	Resistant	Inadequate effort	Appropriate effort	Extensive effort;
Commitment		observed for task	and time on- task,	uses time well; self-
		and /or did not meet	also followed	motivated,
		most criterion	criterion.	surpassed criterion
Points 4/	1	2	3	4
Appearance	Inadequate;	Adequate; needs	Attractive & visually	Eye catching;
	not neat,	more attention to	appealing;	aesthetically
	little care evident	detail	neatly completed	pleasing, beyond
				expectations
				·
Points 4/	1	2	3	4
Creativity	Uses others ideas	Typical responses;	Creative: added to	Unique ideas or
		little creativity	more typical idea	responses
Points 4/	1	2	3	4
Time	Did not complete	Needed frequent	Used time	Autonomous;
Management	task	assistance	appropriately	mature time
				management
Points 4/	1	2	3	4
Carried Out	Did not complete	Completed with	Completed plan;	Followed through
Plan	plan or lacked plan	frequent assistance	limited prompting	well; autonomous;
		and prompting	needed	exceeded
				expectations
				,
Points 4/	1	2	3	4