

CREATION STATION



Group members will work together to solve a STEM (Science, Technology, Engineering, Math) challenge by creating models or designs that demonstrate their understanding of the science topic being taught. Students will place completed projects in a specified location until the entire class is ready to test their designs.

Testing: I recommend setting aside time to test all projects as a class and having each group record their data on their answer sheet and on a class data table. This not only helps with class management, but also lends itself to some friendly competition among your different sections.



Design a Tire Tread Pattern

Challenge: Design a tire tread pattern that will reduce hydroplaning by forcing water out the sides of tread when driving while raining.

Materials (per group):

- Playdough
- Cardboard (4"x6")
- Carving tools
 - plastic knife
 - plastic spoon
 - various art sculpting tools
- Water
- Measuring cup
- Beaker with spout for pouring
- 3 water basins (or basin with divided compartments)
- Protractor
- Student planning sheet
- scissors

System requirements:

Part A:

1. As a group, use the planning sheet to design a tire tread pattern either based on images shown or create a new one. The objective is to try to push water away from the tire (out the sides) so that more of the tire surface touches the road giving the driver increased friction. Water between the surface of the road and the tire could lead to hydroplaning, which could cause a car to slide off the road.
 - No more than 50% of play dough may be carved away.
 - Design must include a path from an opening at the top center of play dough to bottom center for water to be poured through.

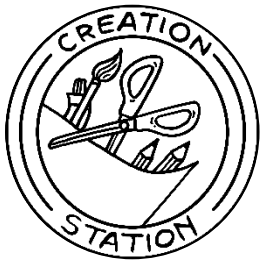
2. Draw a copy of the design on your answer sheet, then cut out the pattern to use as a template on your play dough.

Part B:

1. Shape dough into a 4"x6" rectangle using a cardboard template. The tread should be at least $\frac{1}{4}$ " thick. Place playdough on top of the cardboard for a firm base.
2. Carefully cut out the design using carving and sculpting tools. Make sure to have the design as neat and clean as possible to ensure accurate measurements.
3. Wait for the teacher's instructions on when to test your design. After the test, record the data in the table on your answer sheet and complete the following questions.

Testing:

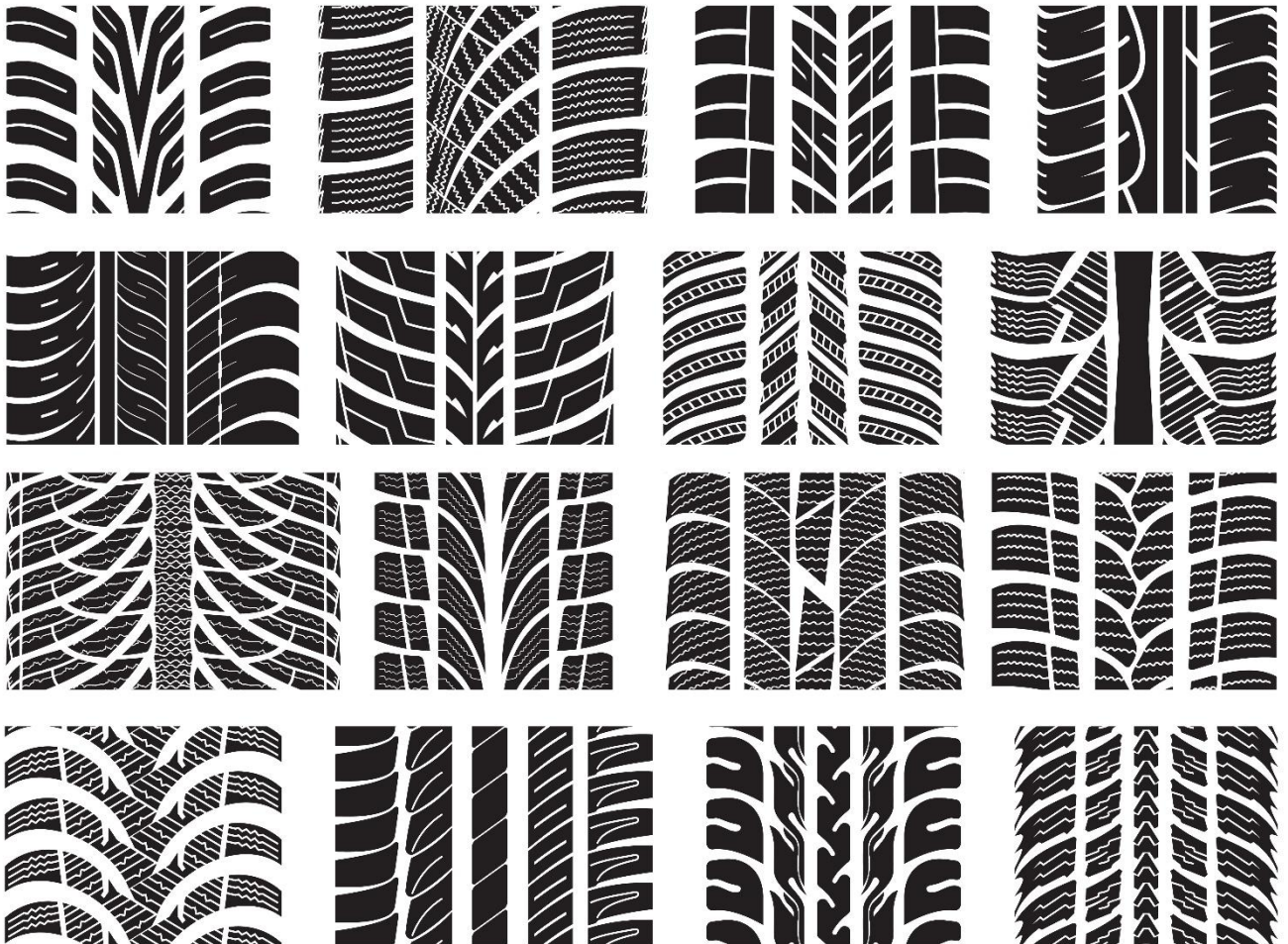
When time allows, test tire tread patterns by setting up design molds on a 25-degree incline (protractor). Pour two cups of water at the top of the mold using a beaker with a spout for a smooth and continuous pour. Measure the water collected in the center container and the right and left containers. Record data in the table on your answer sheet. The goal is to have the highest percentage of water collected in the side containers.



Design a Tire Tread Pattern

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Tire tread patterns to inspire your design!





Design a Tire Tread Pattern

Use the space provided to design a tire tread.
Entire space must be used.

Remember:
No more than
50% may be
cut away.

Must include a
route from
top center to
bottom center.

Copy design on
your answer
sheet BEFORE
you cut out.



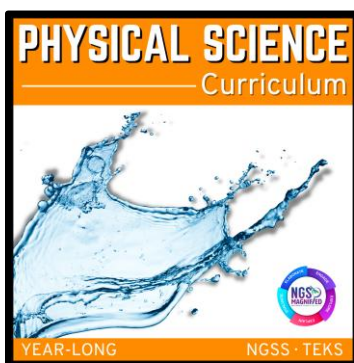
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