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| **Kindergarten NASCAR Challenge!****C:\Users\sse11532\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVQZIEL9\MC900439797[1].png** |
| **Background Information**  |
| We have been learning all about different types of motion. You have been zigzagging and moving your way to learn all about different types of motion. You will have to use your knowledge of pushing, pulling, and movement to solve your design challenge! * This lesson was designed based on the PBS Kids Design Squad lesson “2-Wheel Balloon Car”
* <http://pbskids.org/designsquad/pdf/parentseducators/2wheelcar-english.pdf>
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| **Design Challenge** |
| NASCAR has been looking for a new race car prototype. They would like you to inspire their new race car design. They have hired you to become part of their racing design team. You will need to design a car that you can race by pushing or pulling. Have fun and don’t race too fast! |
| **Criteria** |
| The car must include: * 4 wheels
* 2 axles
* Be able to move by pushing or pulling

The design must:* Have 2 to 3 colors
* Picture and parts labeled
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| **Materials/Tools:** |
| * scissors
* popsicle sticks (large)
* straws
* candy mints (hole in the middle)
 | * rubber band
* masking tape or duct tape
* string
* glue
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| **Standards** |
| **Science*** SKP2. Students will investigate different types of motion.
* a. Sort objects into categories according to their motion. (straight, zigzag, round and round, back and forth, fast and slow, and motionless)
* b. Push, pull, and roll common objects and describe their motions.

**Math*** MCCK.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
* **(Students can measure the distance their car traveled with objects)**
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| **Assessments/Rubrics** |
| * Student Journal
* Teacher Observation
* Student Checklist
* Rubric
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**Instructional Steps:**

1. Tell the students about the challenge. Let them know they will be building a simple car.
2. Investigate the available materials. Discuss what each material might be good for. After they decide that the candies will make good wheels, you may have to demonstrate how to use the straw as an axle (see link at the beginning of the lesson). Note: the link is for teacher information only, as it shows how to make a balloon powered car. It is only included to show the teacher how to make an axle.
3. Allow each student time to draw a picture of his/her plan for the car. Make sure the picture shows them using only the available materials.
4. Build the car.
5. As they finish building, allow for some “test runs”. The students can show you and each other how their car moves by pushing or pulling it. If their car falls apart during test runs, allow the student the time to fix it.
6. Have each student push their car and let it go. Use objects (cubes, paper clips, etc.) to measure how far their car travelled. Create a class graph.
7. Investigate the effects of gravity by setting up a ramp and allowing each student to run their car. Make sure the student understands that they have to apply a force to move the car when the surface is flat, but no other force is necessary when gravity is doing the work.
8. Spend some time sorting the cars into various categories. Some examples may be: by color, size, or shape. By design features (these move by pulling, these move by pushing), by distance travelled, etc.
9. Allow students to spend some time discussing improvements. How would they do it differently next time? Do they see another car with a good idea that they might like to try?
10. Allow the students the opportunity to make some of the improvements they discussed.

**NOTES:**

\*For this lesson, you may decide to go ahead and provide each student with a set of basic materials (4 “wheels”, axles, tape, and tongue depressor “body”) and then have the supplemental and decorative materials available for the students to choose if they need.

\*While the goal is for the students to build their car independently, if you see a student struggling it is always a good idea to help guide their thinking. What’s going wrong? What are you trying to do? What might help fix this problem?

\*The improvement step is very important to the STEM process. It is the step that teaches students to stick with it, “if at first you don’t succeed…” and all that. If their car worked great the first time, this step pushes them into a higher level of thinking about their invention. If their car failed the first time, this step teaches them to continue thinking, evaluate their own work, and possibly change strategies. This is what we are trying to get to transfer over to their academics.

\*Student journal pages are attached to this lesson. Feel free to alter them to suit your needs or add other resources (video clips, KWL, etc).

\*Your team may decide on another “hook” or “wrap up”. Video clips, introductory activities, closing activities, etc. Totally up to you and your team. Study the lesson to decide how to break up your day.

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