

The Need for Speed: A Racing Adventure

Lesson Overview

Subject: Science (Physics/Friction) and Creative Design

Target Age: 5 Years Old

Time: 45-60 Minutes

Learning Objectives

- **Identify** three main parts of a race car (wheels, body, engine).
- **Explain** the concept of friction using "smooth" and "bumpy" surfaces.
- **Predict** which surface will make a car travel the farthest.
- **Demonstrate** sportsmanship by following race safety rules.

Materials Needed

- Small toy cars (Matchbox, Hot Wheels, or similar)
- Flat boards or cardboard pieces to use as ramps
- Different surfaces: A towel/carpet, a smooth floor (tile/wood), and sandpaper or bubble wrap
- Tape (masking or painter's tape) to mark start and finish lines
- Paper, crayons, and stickers for decorating
- A kitchen timer or stopwatch

1. Introduction: The Starting Line (Hook)

The Hook: Start by making a loud "Vroom! Vroom!" engine sound. Wave a checkered flag (or a piece of paper with squares drawn on it).

Talking Points (5-year-old friendly): "Hi, Racer! Today, we aren't just playing with cars; we are becoming Race Scientists! Do you know what makes a car go super fast? Is it the color? The wheels? Today, we are going to learn the secrets of speed, build our own race track, and find out what makes a car win the big trophy!"

The Road Map: "First, we will learn how cars work. Second, we will test different 'roads' to see which is fastest. Third, you will design your own championship track!"

2. Body: Training the Pit Crew

Step 1: Anatomy of a Racer (I Do)

The educator demonstrates using a toy car.

- **The Wheels:** Point to the wheels. "These have to spin fast! If they are stuck, the car won't go."
- **The Body:** "Race cars are low and pointy to slice through the air like a sword."
- **The Engine:** "This is the heart of the car that gives it the 'Push' or 'Force' to move."

Step 2: The Friction Experiment (We Do)

Work together to set up two ramps (cardboard) leaning against a couch or chair.

- **The Setup:** Cover one ramp with a smooth surface (like the bare cardboard) and the other with a "bumpy" surface (like a towel or sandpaper).
- **The Prediction:** Ask the student: "Which road do you think the car will like better? The smooth one or the bumpy one? Why?"
- **The Test:** Let the student release two cars at the exact same time.
- **The Discovery:** Explain that "Friction" is like "invisible glue." Bumpy things have more "glue" and slow the wheels down. Smooth things have less "glue" and let the car zip!

Step 3: The Ultimate Race Challenge (You Do)

The student takes the lead in building their own course.

- **Design:** Give the student tape to mark a "Start" and "Finish" line on the floor.
- **Obstacles:** Encourage them to use household items (blocks, pillows) to create a "Pit Stop" or a "Hairpin Turn."
- **Data Collection:** Have the student race three different cars and help them record which one won by putting a sticker next to the car's name or color on a piece of paper.

3. Conclusion: The Winner's Circle

Recap: "You did it, Racer! Let's look at our scoreboard. Which car was the fastest today? Was it because it had big wheels or was it on a smooth track?"

Closing Discussion: Ask the student to explain "Friction" in their own words. (Success looks like: "The bumpy towel slowed the car down!")

Victory Lap: Have the student do a "victory dance" and award them a "Master Racer" sticker or badge.

Assessment & Success Criteria

Formative Assessment: During the "We Do" phase, observe if the student can correctly predict which surface is faster. Ask: "If I put syrup on the track, would the car go faster or slower?"

Summative Assessment: By the end of the lesson, the student should be able to tell you that smooth surfaces help cars go fast and bumpy surfaces (friction) slow them down.

Success Criteria:

- Student identifies wheels and engine.
- Student uses the word "Smooth" or "Fast" for the cardboard and "Bumpy" or "Slow" for the towel.
- Student successfully completes a "timed" race from start to finish.

Adaptability & Extensions

- **For Advanced Learners:** Introduce a stopwatch. Have them record the seconds for each car and compare the numbers (Which number is smaller? Smaller numbers mean more speed!).
- **For Struggling Learners:** Focus strictly on the sensory aspect. Have them feel the sandpaper vs. the smooth floor before racing the cars.
- **Classroom Variation:** Turn this into a "Grand Prix." Divide students into teams. Each team is responsible for testing one type of surface and reporting their "speed results" to the class.