



Creative Activities for Understanding Factors Affecting Friction in Year 4 Science

1. Friction Experiment Station

Set up various stations with different surfaces (e.g., sandpaper, smooth wood, carpet) and a toy car. Have students measure how far the car travels on each surface using a ruler. They can record their findings in a table and discuss how surface texture affects friction. **Differentiation:** Provide varying levels of support, such as pre-filled tables for lower ability students or extension tasks involving predictions for higher ability students.

2. Friction Race Challenge

Organise a racing event where pairs of students use toy cars on different surfaces (e.g., grass, concrete, lino). Each pair should time how long it takes their car to travel a set distance and discuss how the surface affects the speed of the car. **Differentiation:** Allow students to select their own surfaces based on prior knowledge, or provide visual aids to help them hypothesise about speed and surface impact.

3. Create a Friction Simulation using Coding

Introduce students to a simple coding programme (like Scratch). They can create a digital simulation showcasing different surfaces and their impact on friction when a character moves. **Differentiation:** Offer templates for students who may struggle with coding, while encouraging more advanced students to add complex features, such as obstacles or sound effects.

4. Research Project on Real-World Applications

Assign each student a different profession (e.g., astronaut, race car driver, firefighter). They will research how friction is managed in their chosen profession and create a presentation using PowerPoint or another presentation tool to share their findings. **Differentiation:** Provide a list of guided questions for students needing support or challenge others to include statistical data or case studies in their presentations.

5. Friction and Forces Science Journal

Have students maintain a science journal where they document various friction-related experiments, reflections on what they learned, and drawings depicting their activities.

Differentiation: For visual learners, encourage illustrations and diagrams, while providing sentence starters for students who need help with writing explanations.

6. Interactive Friction Puzzles

Create a set of puzzles where students match different materials to their frictional properties (high friction vs. low friction). They can work in pairs or groups to encourage collaboration and discussion on the findings. **Differentiation:** Adjust the complexity of the puzzles by including fewer or more varied materials based on students' abilities.

7. Friction Measurement with Technology

Using tablets or computers, students can conduct a simple experiment where they measure the force required to slide different objects across various surfaces. They can use digital scales and record their results in a spreadsheet for analysis. **Differentiation:** Provide step-by-step guides for students requiring more support while offering advanced data analysis prompts for more capable students.

8. Create a Friction Board Game

Students will design and create a board game that incorporates obstacles affected by friction (e.g., moving through mud, sliding on ice). This can be played in groups and will encourage collaborative learning and application of concepts. **Differentiation:** Provide examples of existing board games for students who need more guidance while allowing freedom for those wanting to innovate and create unique rules.

9. Virtual Reality Friction Exploration

If available, use virtual reality headsets to explore environments showcasing friction in real-world scenarios, such as sports or vehicles. After the session, students can discuss what they observed and how different factors influenced friction. **Differentiation:** For students who may have difficulty articulating their thoughts, allow them to create a visual mind map of their observations instead.

10. Friction Art Project

Have students create an art piece that visually represents the concept of friction. They can use materials that show different levels of friction (e.g., rubber vs. paper) and explain their choices in a short description. **Differentiation:** Provide a choice of materials and mediums for students to express their understanding, allowing some to create 3D models while others may draw or paint.