

Objective

By the end of this lesson, the student will be able to apply calculus concepts to analyze the motion of a skateboard.

Materials and Prep

- Skateboard
- Measuring tape
- Stopwatch or timer
- Pen and paper

Prior knowledge required: Basic understanding of algebra and geometry.

Activities

1. Activity 1: Measuring Distance

Measure the length of a skateboard ramp using the measuring tape.

Record the distance in meters.

2. Activity 2: Time Trials

Have the student skateboard down the ramp, starting from rest.

Use the stopwatch to time how long it takes for the skateboarder to reach the bottom of the ramp.

Repeat the trial multiple times and record the times.

3. Activity 3: Calculating Average Speed

Divide the distance of the ramp by the average time taken to find the average speed.

Discuss the concept of speed and how it relates to the motion of the skateboard.

4. Activity 4: Calculating Acceleration

Using the recorded times, calculate the acceleration of the skateboarder.

Discuss the concept of acceleration and how it relates to changes in speed.

United Kingdom: Year 7 Talking Points

- "In this lesson, we will explore how calculus can be applied to the motion of a skateboard."

- "We will measure the distance of a skateboard ramp and time how long it takes for a skateboarder to reach the bottom."
- "By calculating the average speed, we can understand how fast the skateboarder is moving."
- "We will also calculate the acceleration, which tells us how quickly the skateboarder's speed is changing."
- "Understanding these concepts can help us analyze the motion of objects in real-life situations, such as skateboarding."