1. **GRADE LEVEL: Grade 7**

Subject Area: Mathematics

Quarter 1 – Week   
Duration: 45 minutes

1. **LEARNING OBJECTIVES**

Learners are expected to:

1. Students will be able to use the formula Distance = Speed x Time to solve for any of the three variables
2. Students will be able to solve problems involving unit rates (e.g., finding the cost of one item to compare value)
3. Students will be able to solve other rate problems, such as flow rate or work rate.
4. **CONTENT**

* Title: Putting Rates to Work: Solving Problems
* Learning Competency: solve problems involving rates (e.g., speed).
* Particular Focus: Applying the concept of rates to solve mathematical problems, with a primary focus on speed, distance, and time, as well as unit rates.

1. **LEARNING RESOURCES**

1. Teacher's Guide
2. Calculators
3. Worksheets with rate problems
4. Stopwatches and measuring tape (for optional activity)
5. PPT: 'Solving with Rates'
6. **PROCEDURE**

**Introduction:**

Review the definition of a rate. Pose a warm-up problem: 'If a car travels at 60 miles per hour, how far does it go in 2 hours?' Most students will solve this intuitively. Use this to introduce the formula triangle for Distance, Speed, and Time (D=S\*T).

**Presentation:**  
The teacher explicitly teaches the D=S\*T formula and how to manipulate it to solve for S (D/T) or T (D/S). They model several examples. Then, the teacher introduces 'unit rate' problems, such as: 'If 5 apples cost $2.00, what is the cost per apple?' They demonstrate how to find the unit rate and use it for comparison shopping. A brief mention of other rates (e.g., gallons per minute) is included.

**Practice:**  
Students work on a 'Rate Race' worksheet with a variety of problems. Problem types include: calculating distance, calculating speed, calculating time, finding the best value by comparing unit prices, and a challenge problem involving a simple flow rate (e.g., 'A tap fills a 10-gallon bucket in 2 minutes. What is the flow rate in gallons per minute?'). An optional hands-on activity: have students measure a distance in the classroom, time how long it takes to walk it, and calculate their own speed.

**Integration:**  
Connect to physics (kinematics), travel planning (estimating arrival times), and personal finance (comparison shopping). Discuss how understanding rates is essential for planning and efficiency in many real-world situations. Values: Critical thinking and problem-solving.

**Assessment:**  
['1. A train travels at 80 km/h for 3 hours. How far does it travel? (240 km)', ' 2. It took you 4 hours to drive 260 miles. What was your average speed? (65 mph)', ' 3. A box of 12 pencils costs $3.00. What is the unit price per pencil? ($0.25)', ' 4. A hose fills a pool at a rate of 10 gallons per minute. How long will it take to fill a 200-gallon pool? (20 minutes)']

**Enrichment:**  
["Remediation: Focus only on the D=S\*T formula first. Use a physical 'formula triangle' that students can cover to see the relationship. Use whole numbers in problems to reduce cognitive load.", " Enhancement: Give students multi-step problems, e.g., 'A car travels for 2 hours at 60 mph, then for 1 hour at 40 mph. What is the total distance and the average speed for the whole trip?'"]  
**Asignment:**  
Solve the following problem: You are going on a 300-mile road trip. If you want to arrive in 5 hours, what average speed must you maintain? If you can only average 50 mph, how long will the trip take?

1. **EVALUATION TOOLS**

The worksheet will be the primary assessment tool, graded for accuracy. An exit ticket will ask students to solve one speed problem and one unit rate problem. Observing the optional hands-on activity can provide insight into students' understanding.

1. **REMARKS**

The formula triangle is a very helpful visual aid for many students. Ensure calculators are available. The most common error in unit pricing is dividing the wrong way (items/price instead of price/item). Emphasize that you want the 'cost per ONE item'.

1. **REFLECTION**

Students grasped the speed-distance-time calculations fairly easily, thanks to the formula triangle. The unit price problems were also well-understood and students enjoyed the 'best buy' scenarios. The optional hands-on activity was a highlight for those who did it. I need to create more varied rate problems for the next lesson, moving beyond just speed and price.