



Name _____ Class _____ Date _____

AFTER THIS WORKSHEET YOU CAN

- ✓ Understand: What is the Doppler Effect?
- ✓ Understand: Approaching Source
- ✓ Understand: Receding Source
- ✓ Understand: Doppler Effect for Sound



Section A • Concept Check

• BEGINNER

4 × 1 = 4

- 1 A car horn sounds higher-pitched as the car approaches you. What does this indicate about the car's motion?

- 2 A star's light is blueshifted. What does this suggest about its motion relative to Earth?

- 3 Why does a passing train's whistle seem to drop in pitch right as it passes you?

- 4 How do astronomers use the Doppler effect to study the expansion of the universe?



Section B • Problem Solving

• INTERMEDIATE

4 × 3 = 12

- 5 Does the Doppler effect apply only to sound, or also to other types of waves?

- 6 A weather radar uses the Doppler effect to detect storm movement. What is it actually measuring?

- 7 If both the source and observer are stationary, does the Doppler effect occur?

- 8 Why might a siren sound normal in pitch if it's moving directly sideways relative to you (not toward or away)?



Section C • Challenge

• CHALLENGE

2 × 2 = 4

- 9 What happens to the observed frequency if the source moves toward the observer faster and faster?

- 10 Why is the Doppler effect useful for police radar guns measuring vehicle speed?

Reflection — the most useful thing I learned: _____

✂ ANSWER KEY – FOLD OR CUT BEFORE HANDING OUT

1 = It's moving toward you 2 = It's moving toward Earth 3 = The train transitions from approaching (compressed waves, higher pitch) to receding (stretched waves, lower pitch) right as it passes 4 = Widespread redshift observed in distant galaxies indicates they are generally moving away from us, providing evidence for cosmic expansion | 5 = It applies to all types of waves, including light and other electromagnetic waves 6 = The frequency shift of radar waves reflecting off precipitation, revealing the precipitation's motion relative to the radar 7 = No, the Doppler effect requires relative motion between source and observer 8 = There is little to no relative motion along the line connecting the source and observer, minimizing the Doppler shift | 9 = The observed frequency increases even more (a greater Doppler shift) 10 = The frequency shift of the reflected radar wave directly relates to the vehicle's speed relative to the radar gun