



- Level Pacer is an instructional board game developed to help students understand and apply the concepts of time, distance, and speed. Using a progressive levelbased structure, students engage with increasingly complex questions and realworld scenarios, applying mathematical operations and logical reasoning to solve them. The game uses colour-coded levels and integrates individual and group tasks to encourage collaboration and mastery of foundational physics concepts.
- The game is structured into three progressively challenging levels:
 Golden Light (Level 1): Focuses on basic definitions and unit knowledge
 - Grass Green (Level 2): Introduces problem-solving using formulas
 - Purple Power (Level 3): Involves complex, real-world application problems
- By the end of the game, students will be able to define relevant terms, apply appropriate formulas, and solve contextual problems involving speed, distance, and time with confidence.
- A complete game set, for one group, includes the following materials:
 - 1 Pacer board
 - \circ 1 dice
 - 4-5 counters (one per player)
 - Coins
 - Answer sheet

Gameplay Instructions

- Divide the class into groups of 4–5 students.
- Each player selects a counter and places it at the Start on the game board.
- Students will use their notebooks to solve questions as they land on them.
- Players take turns rolling the dice and move their counters accordingly.
- When a player lands on a square, they read the question written on that space.
- The player solves the question in their notebook, either independently or by briefly discussing with group members.
- If the response is correct, the player remains on the square. If the answer is incorrect, they go back two spaces (optional rule).
- All players must respond to each level's questions in sequence; skipping levels is not allowed.

Debriefing and Reflection

Conclude the game with a whole-class reflection to reinforce learning. Suggested discussion prompts:

- Players take turns rolling the dice and move their counters accordingly.
- When a player lands on a square, they read the question written on that space.
- The player solves the question in their notebook, either independently or by briefly discussing with group members.

- If the response is correct, the player remains on the square. If the answer is incorrect, they go back two spaces (optional rule).
- All players must respond to each level's questions in sequence; skipping levels is not allowed.

Adaptations for Gamplay

For Lower Grades: Simplify board questions to include definitions and direct formula application. Reduce board length or allow peer collaboration on each question.

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For Higher Grades: Add timed responses or bonus challenges for certain squares. Encourage students to explain their reasoning orally or in writing before progressing



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START

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l How can we define time?	2 What is the standard unit of time? What symbol we use to represent it?	3 What is the symbol for time?	4 What is distance?	5 What is the SI unit of distance?	6 What is the symbol for distance?	7 What is speed?	G
8 What is the SI unit of speed?	9 What is the symbol for distance?	10 On which two quantities speed depends?	1	11 If we increase speed time will increase or decrease?	12 If we decrease speed time will increase or decrease?	13 If we increase speed, we will be able to cover distance quickly or late?	RASS GRE
	19 What mathematical operation you did/can do to find speed in situation 2	18 What mathematical operation you did/can do to find speed in situation 1	17 What mathematical operation you should do to find speed when distance and time are given?	16 2. If distance is 10m to cover the distance in the 2 minuets time What should be our speed?	15 I.If distance is 20m to cover the distance in the 4 minuets time What should be our speed?	14 If we decrease speed, we will be able to cover distance quickly or late?	
20 If V represent speed Shows distance and T shows time than how you will find V with help of D and T?	21 Make an equation for speed?	22 If t is 15 seconds S is 60 meter V will be?	23 If S is 30 m V is 10m t will be?	24 If t is 10 m, v is 5m/s, S will be?	25 What distance does an aeroplane travel, flying at 380mph for nine hours?	26 A train travels 604km in 4 hours. What is its average speed?	
27 How long does it take to drive 540 miles, driving at an average speed of 60mph?	28 A mouse can run at 8mph. How far can it run in 15 minutes?	29 A snail has taken one hour to crawl 0.6 meters. What is its average speed in cm/metres?	30 The ferry to Lerwick left Aberdeen harbour at 17:30 and sailed at a steady speed of 18mph. How far out to sea is the ferry at 21:30?	31 If a pet cat's top speed is 30mph, how long would it take to run 3 miles?	32 The distance from J ohn O'Groats to Dumfries is approximately 350 miles. If it takes you 7 hours to drive this route, what has been your average speed?	33 The distance from Aberdeen to Glasgow is approximately 240km. How long does it take to make this journey driving at an average speed of 60km/h?	
34 soch Ness is approximately 36km long. How long would it take a swimmer, swimming at an average speed of 4km/h, to swim the Loch?	35 The distance from Glasgow to Edinburgh is approximately 75km. If a delivery driver makes the journey there and back twice, at an average speed of 60km/h, what is his total driving time?	36 The Aberdeen to London train takes approximately 7 hours at an average speed of 91km/h. What is the distance from Aberdeen to London?	37 The Aviemore to Wick train takes 5 hours to complete the journey of 130 miles. What is the average speed of the train?	38 It takes approximately 14 hours to fly from Edinburgh to Hong Kong. If the plane travels at 680km/h, how far is it from Edinburgh to Hong Kong?	39 The flight time from Glasgow to Vancouver, Canada is approximately 10 hours and 30 minutes. If the distance is approximately 7035km , what is the average speed of the plane?	END	

ANSWER SHEET

- 1. Time is a measure of the duration of events and the intervals between them.
- 2. The SI unit of time is the second (s).
- 3. The symbol for time is "T"
- 4. Distance is the measure of how far an object has traveled from one point to another.
- 5. The SI unit of distance is the meter (m).
- 6. The symbol for distance is "D" or "S"
- 7. Speed is the rate at which an object covers distance.
- 8. The SI unit of speed is meters per second (m/s).
- 9. The symbol for speed is "V"
- 10. Speed depends on distance (D) and time (T).
- 11. If speed increases, the time taken to cover a distance decreases.
- 12. If speed decreases, the time taken to cover a distance increases.
- 13. If speed increases, we will cover the distance more quickly.

- 14. To determine speed, use the calculation: speed = distance / time.
- 15. To find time, use the calculation: time = distance / speed.
- 16. To find speed, use the calculation: speed = distance / time.
- 17. Speed = distance / time = 10 meters / 2 minutes = 5 meters per minute.
- Speed = distance / time = 20 meters / 4 minutes = 5 meters per minute.
- 19. If speed decreases, we will cover the distance more slowly.
- 20. Speed (V) can be found using the formula: V = D / T.
- 21. The equation for speed is: speed = distance / time (v = d / t).
- 22. V = D/T = 60 meters / 15 seconds = 4 meters per second.
- 23. T = S / V = 30 meters / 10 meters per second = 3 seconds.
- 24. Distance covered = V * T = 5 meters per second * 10 meters = 50 meters.
- 25. Distance = speed * time = 380 mph * 9 hours = 3420 miles.
- 26. Average speed = distance / time = 604 kilometers / 4 hours = 151 kilometers per hour.

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20 miles. ⁄ 4 hours = 151

- 27. Time = distance / speed = 540 miles / 60 mph = 9 hours.
- Distance = speed * time = 8 mph * (15 minutes / 60 minutes per 28. hour) = 2 miles.
- Average speed = 0.6 meters / 1 hour = 0.6 meters per hour. 29. In centimeters per hour: 0.6 meters * 100 = 60 centimeters per' hour.
- 30. Time elapsed = 21:30 17:30 = 4 hours. Distance = speed * time = 18 mph * 4 hours = 72 miles.
- Time = distance / speed = 3 miles / 30 mph = 0.1 hours = 6 minutes. 31.
- 32. Average speed = distance / time = 350 miles / 7 hours = 50 mph.
- 33. Time = distance / speed = 240 kilometers / 60 kilometers per hour = 4 hours.
- 34. Time = distance / speed = 36 kilometers / 4 kilometers per hour = 9 hours.
- 35. Total distance = 75 kilometers *4 = 300 kilometers. Total driving time = distance / speed = 300 kilometers / 60 kilometers per hour = 5 hours.

- Average speed = distance / time = 130 miles / 5 hours = 26 mph. 36.
- Distance = speed * time = 680 kilometers per hour * 14 hours = 37. 9520 kilometers.
- 38. Time = 10 hours + 30 minutes / 60 minutes per hour = 10.5 hours. Average speed = distance / time = 7035 kilometers / 10.5 hours = 670 kilometers per hour.
- Average speed = distance / time = 7035 kilometers / 10.5 hours = 39. 670 kilometers per hour.