SPEED, DISTANCE AND TIME

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

Speed tells you how far you travel in 1 hour.

30 mph means 30 miles per hour:
30 miles every hour.



× 2 (1 hour = 30 miles / 2 hours = 60 miles) × 2

Do the same to both sides.

1 How many minutes are in each part of an hour? Look at the clocks.



1 hour = ☐ min



½ hour = ☐ min



¼ hour = ☐ min



¾ hour = ☐ min

2 A bus travels 40 miles every hour. Use the frames.



a) How far in 3 hours?

× 3 (1 hour = 40 miles / 3 hours = ☐ miles) ☐

b) How far in 5 hours?

☐ (1 hour = 40 miles / 5 hours = ☐ miles) ☐

3 Divide to find how far each one travels in 1 hour.

a) Sam cycles 36 km in 3 hours.

÷ 3 (3 hours = 36 km / 1 hour = ☐ km) ☐

b) A train goes 240 miles in 4 hours.

☐ (4 hours = 240 miles / 1 hour = ☐ miles) ☐

c) So the train's speed is ☐ mph.

4 Draw a line to match each unit to its meaning.

mph	metres per second
km/h	miles per hour
m/s	kilometres per hour

SPEED, DISTANCE AND TIME

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

speed = distance ÷ time

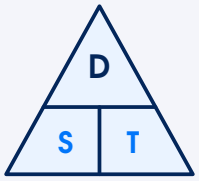
distance = speed × time

time = distance ÷ speed

140 miles in 2 hours:

÷ 2 (2 hours = 140 miles ; 1 hour = 70 miles) ÷ 2

Speed = 70 mph



1 Find each speed: the distance travelled in 1 hour is the speed.

a) A van goes 150 miles in 3 hours.

÷ 3 (3 hours = 150 miles ; 1 hour = ☐ miles) ☐

b) A boat goes 96 km in 2 hours.

☐ (2 hours = 96 km ; 1 hour = ☐ km) ☐

2 Find each distance.

a) A car at 45 mph for 4 hours

× 4 (1 hour = 45 miles ; 4 hours = ☐ miles) ☐

b) A cyclist at 12 km/h for 3 hours

☐ (1 hour = 12 km ; 3 hours = ☐ km) ☐

3 How long does each journey take?

a) 200 miles at 50 mph

× 4 (1 hour = 50 miles ; ☐ hours = 200 miles) ☐

b) 90 km at 30 km/h

☐ (1 hour = 30 km ; ☐ hours = 90 km) ☐

4 A car travels at a constant speed of 60 mph.

Remember: 30 minutes = ½ hour.

a) How far in ½ hour?

÷ 2 (1 hour = 60 miles ; ½ hour = ☐ miles) ☐

b) How far in 15 minutes?

☐ (60 min = 60 miles ; 15 min = ☐ miles) ☐

SPEED, DISTANCE AND TIME

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Use the same units. Change minutes into hours first.

15 min = 0.25 h **45 min = 0.75 h**

1.25 hours = 1 hour 15 minutes (not 1 h 25 min)

48 km/h for 20 minutes:

÷ 3 (**60 min = 48 km** / **20 min = 16 km**) ÷ 3

FLUENCY

1 Complete the table. Give the time in hours and minutes.

	DISTANCE	SPEED	TIME
a	225 km		3 hours
b	208 km	64 km/h	
c	33 miles		45 minutes

2 A coach travels at a constant speed of 54 mph. Choose your own operations.

a) How far does it go in 40 minutes?

□ (**60 min = 54 miles** / **40 min =** □) □

b) How long to travel 81 miles?

□ (**60 min = 54 miles** / □ **= 81 miles**) □

REASONING

3 Leah walks 9 km in 2 hours 15 minutes. She works out her speed as 9 ÷ 2.15 = 4.19 km/h.

a) Explain Leah's mistake.

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b) Work out Leah's correct speed.

4 Ravi runs 5 km in 25 minutes. Mia runs 3 km in 14 minutes. Who runs faster? Show working that would convince someone.

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.....

.....

SPEED, DISTANCE AND TIME

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) Doubling the speed halves the journey time. ALWAYS SOMETIMES NEVER

b) Return trip average speed = mean of the two speeds. ALWAYS SOMETIMES NEVER

c) A speed in km/min is a bigger number than in km/h. ALWAYS SOMETIMES NEVER

d) A longer journey time means a lower average speed. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 Jas cycles 24 km at 12 km/h. She then cycles 30 km at 30 km/h.

a) Work out the total time of the ride.

b) Work out her average speed for the whole ride.

c) Why is the answer not the mean of 12 km/h and 30 km/h?

3 At 10:00 two trains are 210 km apart. They travel towards each other on parallel tracks, one at 80 km/h and the other at 60 km/h.

a) At what time do the trains meet?

b) How far has the faster train travelled when they meet?

★ CHALLENGE FOR ALL

4 Ali must drive 150 miles in 3 hours. For the first 2 hours he averages 45 mph.

a) What average speed does he need for the rest of the journey?

b) Instead, Ali averages 40 mph for the first 2 hours 15 minutes. Can he still arrive on time without driving faster than 70 mph? Show how you know.

SPEED, DISTANCE AND TIME – ANSWERS

ANSWERS

BUILDING BLOCKS

1. 1 hour = 60 min · ½ hour = 30 min · ¼ hour = 15 min · ¾ hour = 45 min
2. a) × 3 on both sides: 120 miles · b) × 5 on both sides: 200 miles
3. a) ÷ 3 on both sides: 12 km · b) ÷ 4 on both sides: 60 miles · c) 60 mph
4. mph → miles per hour · km/h → kilometres per hour · m/s → metres per second

SUPPORT

1. a) ÷ 3 on both sides: 50 miles in 1 hour, so 50 mph · b) ÷ 2 on both sides: 48 km in 1 hour, so 48 km/h
2. a) × 4 on both sides: 180 miles · b) × 3 on both sides: 36 km
3. a) × 4 on both sides: 4 hours · b) × 3 on both sides: 3 hours
4. a) ÷ 2 on both sides: 30 miles · b) ÷ 4 on both sides: 15 miles

CORE

1. a) 75 km/h · b) 3.25 h = 3 hours 15 minutes · c) 45 min = 0.75 h, so 44 mph
2. a) e.g. ÷ 3 then × 2, or × 2/3, on both sides: 36 miles · b) × 1.5 on both sides: 90 minutes (1 hour 30 minutes)
3. a) 2 hours 15 minutes is 2.25 hours, not 2.15 hours · b) 9 ÷ 2.25 = 4 km/h
4. Ravi: 5 ÷ (25/60) = 12 km/h · Mia: 3 ÷ (14/60) ≈ 12.9 km/h, so Mia is faster (or: Ravi takes 5 min per km, Mia about 4.7 min per km)

GREATER DEPTH

1. a) Always · b) Sometimes: only when both speeds are equal, e.g. 60 km at 30 km/h then 60 km at 60 km/h gives 120 km in 3 h = 40 km/h, not 45 km/h · c) Never: km per minute is 60 times smaller · d) Sometimes: 100 km in 2 h (50 km/h) is faster than 20 km in 1 h (20 km/h)
2. a) 2 h + 1 h = 3 hours · b) 54 ÷ 3 = 18 km/h · c) the mean of 12 and 30 is 21 km/h, but she spends twice as long at the slower speed
3. a) They close at 140 km/h: 210 ÷ 140 = 1.5 h, so 11:30 · b) 80 × 1.5 = 120 km
4. a) 150 – 90 = 60 miles in 1 hour: 60 mph · b) 40 × 2.25 = 90 miles, leaving 60 miles in 0.75 h, which needs 80 mph, so no