Speed and Acceleration Challenge

Name _____

What do the following units represent? Use D for distance, T for time, S for speed, or A for acceleration.

D 1. 14 km	T 4. 6 hours	D 7. 14 mi	D 10. 1.4 m
S 2. 30 m/s	A 5. 12 cm/s²	T 8. 3.2 sec	D 11. 6 cm
T 3. 34 min	S 6. 150 mph	D 9. 25 ft	S 12. 3 km/hr

Solve each problem! Be sure to show your work!

13. Goldie Goldfish, a speed swimmer, loves to race around the park's pond. If she can swim 10 miles around the pond in 2 hours, what is her average speed?

Formula:	$S = \frac{d}{t}$
Substitution:	$S = \frac{10\,mi}{2\,hr}$
Final Answer with Units:	$S = 5\,mi/hr$

14. It takes Stu, a slimy slug, 20 minutes to travel from his favorite bush to the local trash can (a trip of 30 meters), how far can he travel in 1 hour (60 minutes)?

Formula:	$d = s \times t$
Substitution:	$d = \_\_ \times 60\,min$ $d = 90$ $S = \frac{d}{t}\ \frac{30m}{20min} = 1.5\,m/min$
Final Answer with Units:	$d = 90m$

15. At exactly 2:00 pm, Speedy the Snail crawls onto a meter stick at the 10 cm mark. If he reaches the 65 cm mark at exactly 2:10 pm, what is his speed?

Formula:	$S = \frac{d}{t}$
Substitution:	$S = \frac{55cm}{10\,min} = 5.5\,cm/min$ $65cm - 10cm = 55cm$
Final Answer with Units:	$5.5\,cm/min$

16. If it takes Leaping Louie 5 minutes to jump 3 blocks, how long will it take for him to jump 15 blocks?

Formula:	$t = \frac{d}{s}$
Substitution:	$t = \frac{15 \text{ blocks}}{s = 0.6 \text{ blocks/min}}$ $s = \frac{d}{t}$ $\frac{3 \text{ blocks}}{5 \text{ min}} = 0.6 \text{ block/min}$
Final Answer with Units:	$t = 2.5 \text{ min}$

17. Toon Train is traveling at the speed of 10 m/s at the top of a hill. Five seconds later it reaches the bottom of the hill and is moving at 30 m/s. What is the rate of acceleration of Toon Train?

Formula:	$a = \frac{V_f - V_i}{t}$ acceleration $= \frac{\text{Final speed} - \text{initial speed}}{\text{time}}$
Substitution:	$a = \frac{30 \text{m/s} - 10 \text{m/s}}{5 \text{s}} = \frac{20 \text{m/s}}{5 \text{s}}$ $\frac{\frac{m}{s}}{\frac{s}{1}}$ Keep change flip $\frac{m}{s} \times \frac{1}{s} = \frac{m}{s^2}$
Final Answer with Units:	$a = 4 \text{m/s}^2$

18. Pete the Penguin loves to sled down his favorite hill. If he hits a speed of 50 m/s after 5 seconds, what is his rate of acceleration? Hint: He starts at 0 m/s at the top of the hill.

Formula:	$a = \frac{V_f - V_i}{t}$ acceleration $= \frac{\text{Final speed} - \text{initial speed}}{\text{time}}$
Substitution:	$a = \frac{50 \text{m/s} - 0 \text{m/s}}{5 \text{s}}$
Final Answer with Units:	$a = 10 \text{m/s}^2$

19. Monster Mike's truck decelerates from 72 m/s to 0 m/s in 6 seconds. What is his rate of deceleration?

Formula:	$a = \frac{V_f - V_i}{t}$ acceleration $= \frac{\text{Final speed} - \text{initial speed}}{\text{time}}$
Substitution:	$a = \frac{0 \text{m/s} - 72 \text{m/s}}{6 \text{s}}$
Final Answer with Units:	-12m/s^2

20. Review Formulas:

Concept	Formula
Speed	$s = \frac{d}{t}$
Acceleration	$a = \frac{V_f - V_i}{t}$ acceleration $= \frac{\text{Final speed} - \text{initial speed}}{\text{time}}$