

Name \_\_\_\_\_  
Date \_\_\_\_\_ Per. \_\_\_\_\_

## Force and Motion – Balanced and Unbalanced Forces

*Fill in the blanks below:*

- Two forces are balanced when they are \_\_\_\_\_ in size but act in \_\_\_\_\_ directions.
- When the forces on an object are balanced it will move at \_\_\_\_\_ speed in one \_\_\_\_\_ or remain at \_\_\_\_\_.
- When the forces on an object are unbalanced, it will speed up (\_\_\_\_\_) slow down (\_\_\_\_\_) or change \_\_\_\_\_.

*Write the definitions of the words below:*

Resistance - \_\_\_\_\_  
\_\_\_\_\_

Drag - \_\_\_\_\_  
\_\_\_\_\_

Friction – \_\_\_\_\_  
\_\_\_\_\_

Thrust – \_\_\_\_\_  
\_\_\_\_\_

Turbulence – \_\_\_\_\_  
\_\_\_\_\_

**Balanced Forces**



What you need to know:

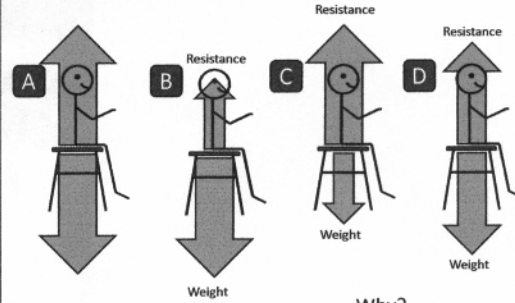
- What are balanced forces and how do they affect objects?
- How do unbalanced forces affect objects?
- How can we show the forces acting on an object?

To Do:

- Draw a diagram showing the forces on somebody sitting on a lab stool

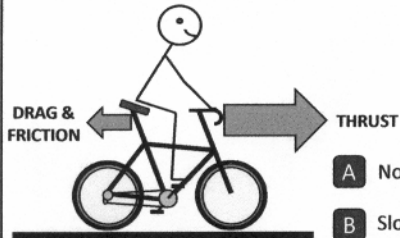


Which diagram is correct?



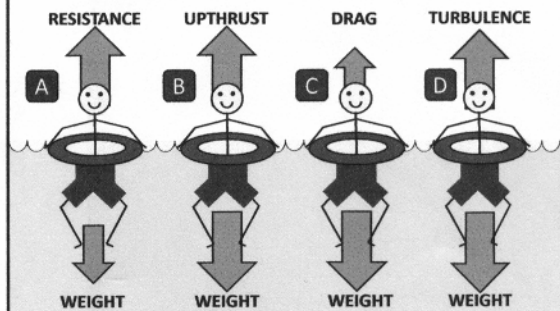
Why?

What is the bicycle doing?



- A Not moving
- B Slowing down
- C Speeding up
- D Moving at constant speed

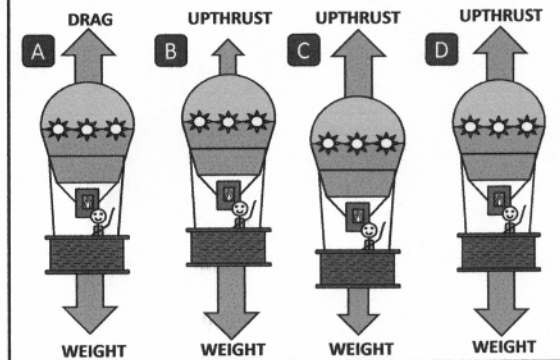
If the swimmer is floating, which diagram is correct?

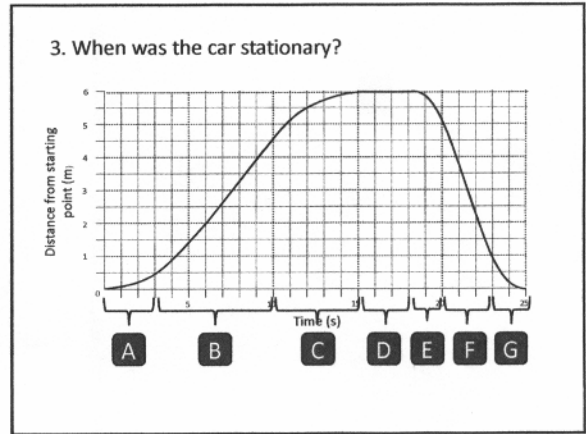
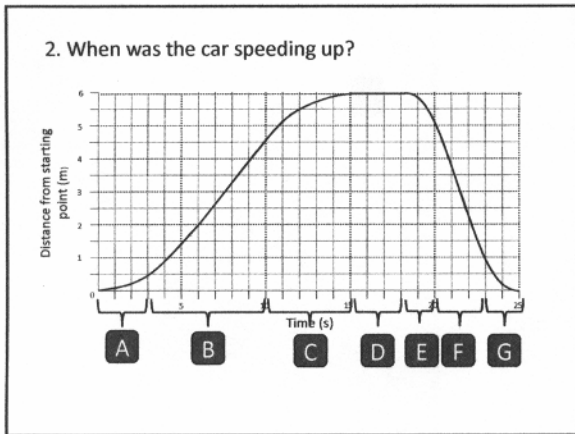
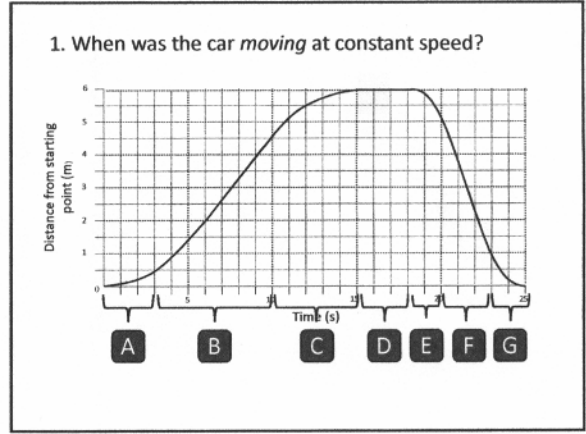
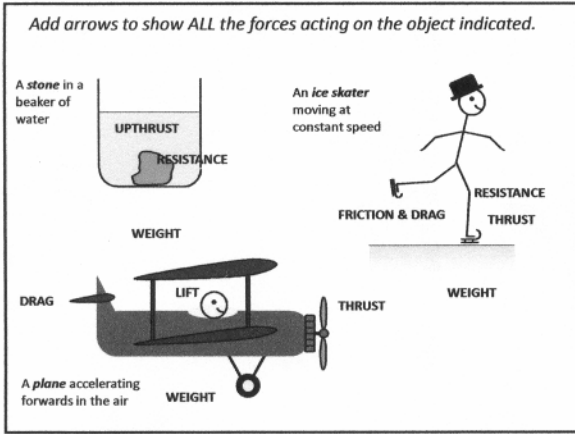
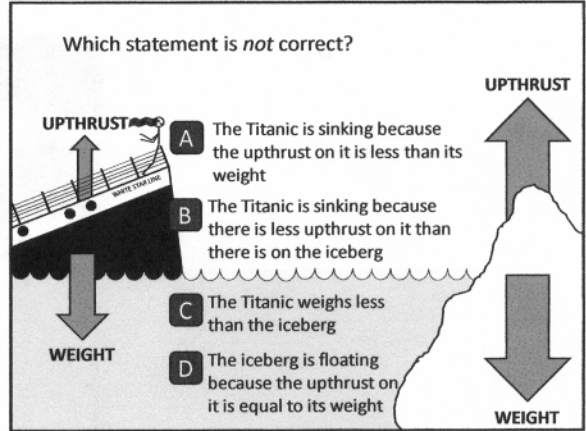
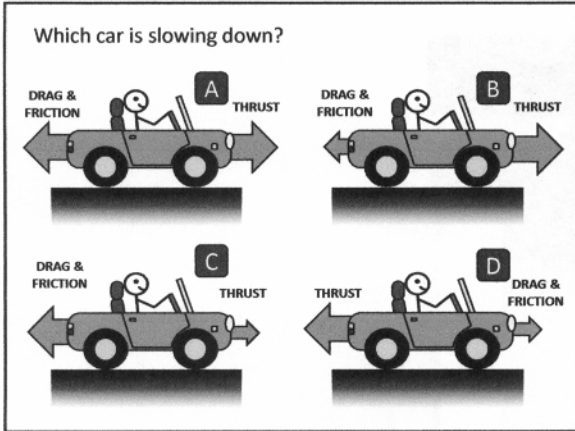


What is the parachutist doing?

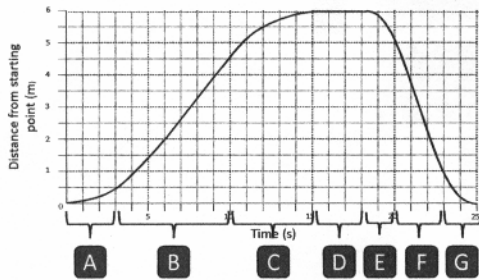
- A Hovering in the air
- B Falling at constant speed
- C Slowing down
- D Speeding up (plunging to a horrible death)

Which diagram shows a balloon floating at a constant height?

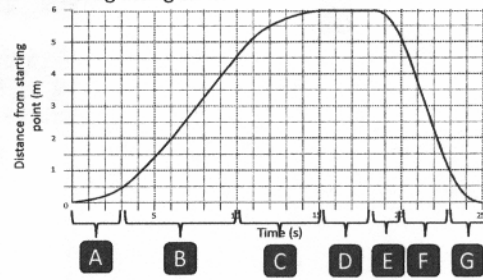




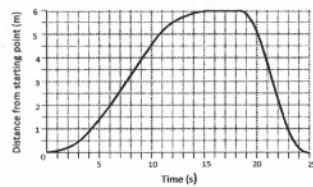
4. When were the forces on the car balanced?



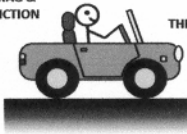
5. When was the thrust on the car greater than the drag acting on it?



6. Draw a diagram of the forces acting on the car at time = 24s



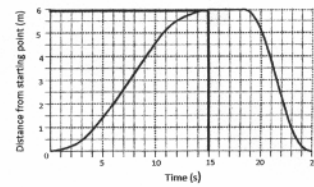
DRAG & FRICTION



THRUST

What is the car doing at this point?

7. What is the average speed between 0s and 15s?



$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

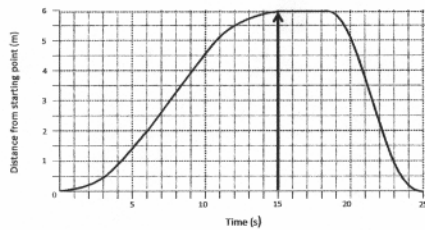
$$\text{Speed} = \frac{\quad}{\quad} = \quad$$

Time =

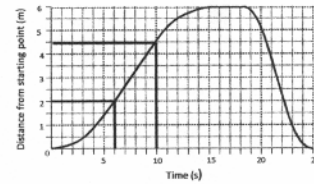
Distance =

Did you set out your calculations correctly?

8. What is the speed of the car at 15s?



9. What is the *maximum* speed of the car between 0s and 15s?



$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Speed} = \frac{\quad}{\quad}$$

Why is this not the same as the average speed?

Time =

Distance =

=