CFA #1 PS2.3

8.PS2.3) Create a demonstration of an object in motion and describe the position, force, and direction of the object.

-Balanced and Unbalanced Forces

-Motion Maps

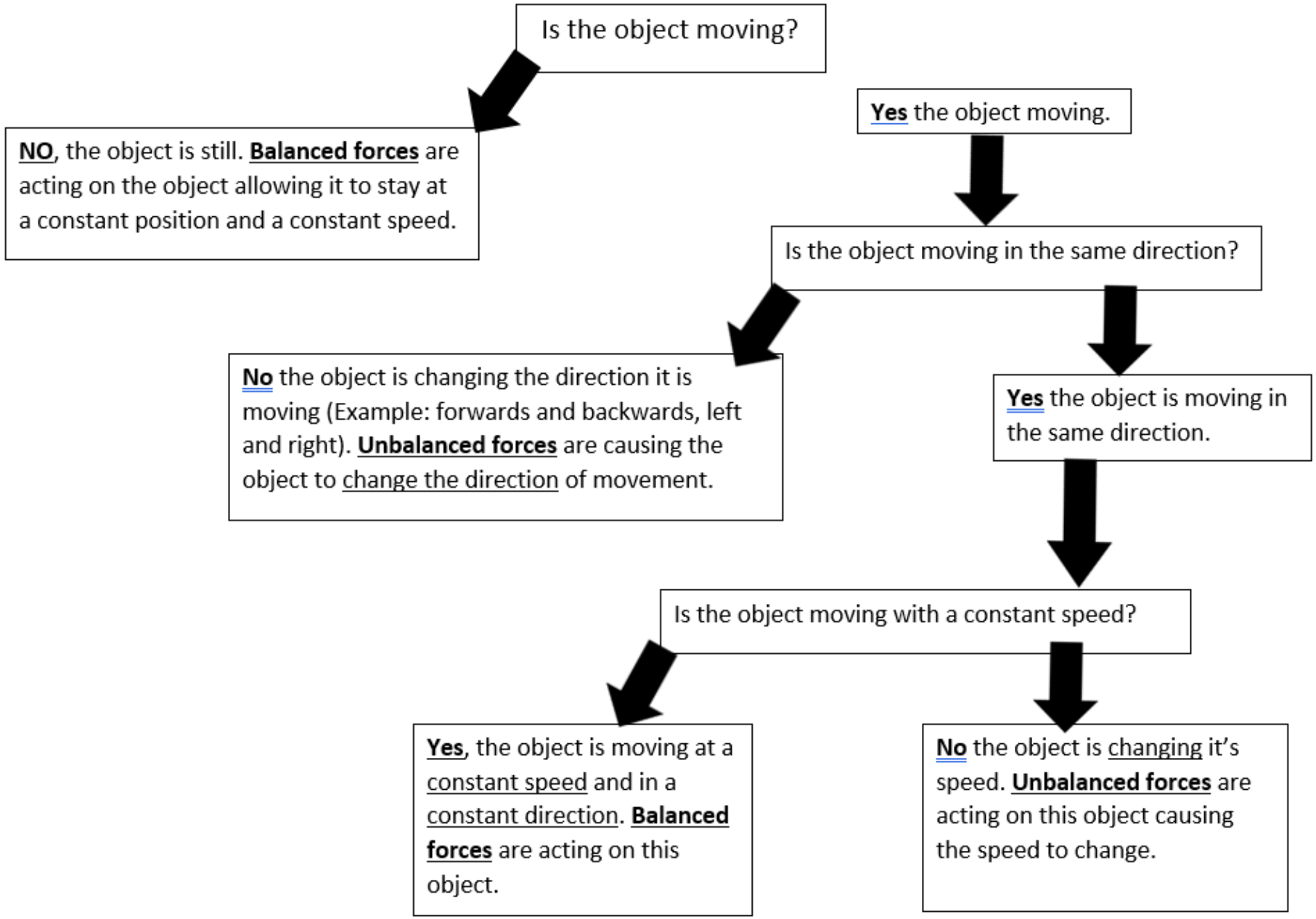
-Time Position Graphs

Balanced or Unbalanced

- **Balanced** force allow an object to continue its current state
  - Example: balanced forces allow an object to continue moving at its current steady speed
- **Unbalanced** forces will cause a change in an objects current state
  - Example: unbalanced forces cause an object to change speed

- **Inertia** is the resistance to change (an object in motion stays in motion or an object at rest stays at rest until acted upon by an unbalanced force)

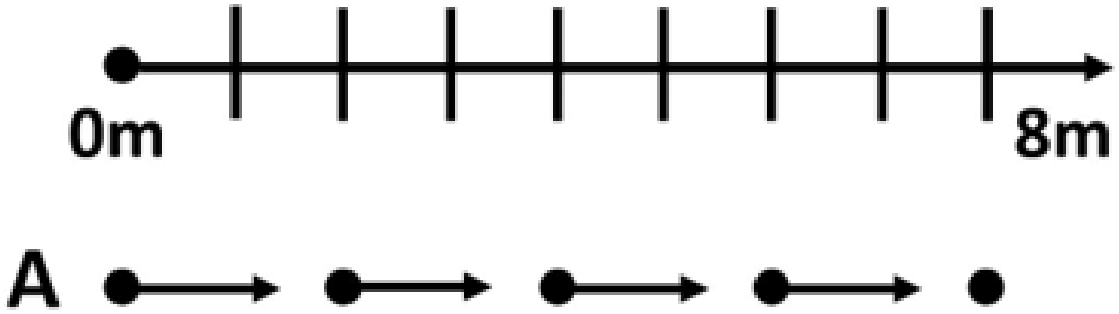
Balanced and Unbalanced Forces



Motion Maps

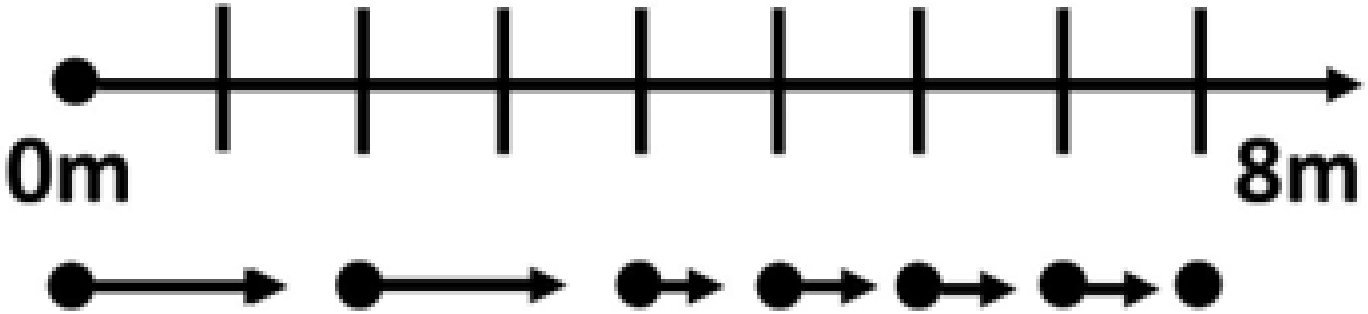
- A motion map is used to depict the movement and direction of movement for an object.

Example: In the motion map shown below the object moves at a rate of 2 m/s for 4 seconds in the positive direction.



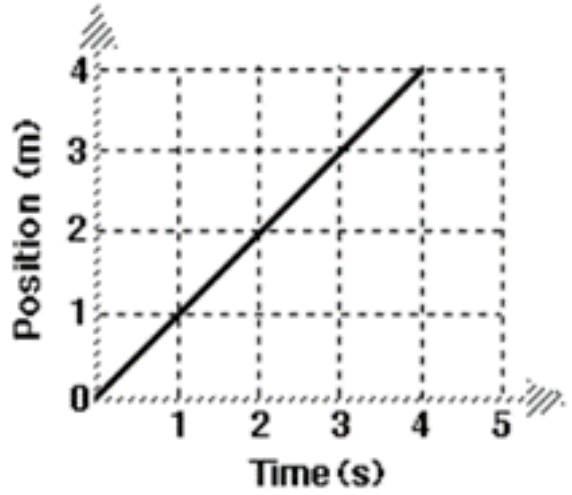
Motion Maps

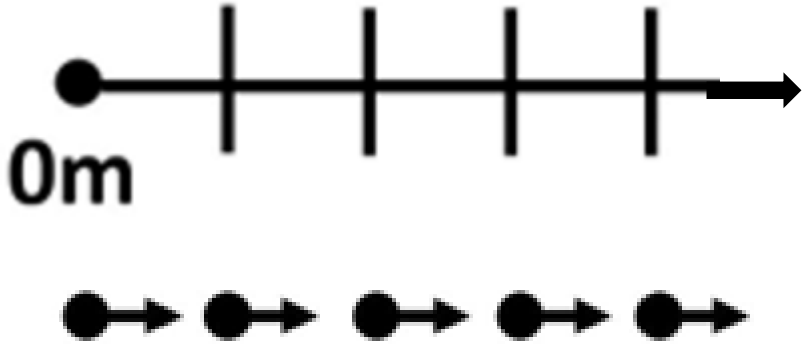
In the motion map shown below the object changes its speed. The object begins to moving with a positive velocity at a rate of 2m/s for 2 seconds and then decreases its speed to a rate of 1 m/s for 4 seconds



Time Position Graph

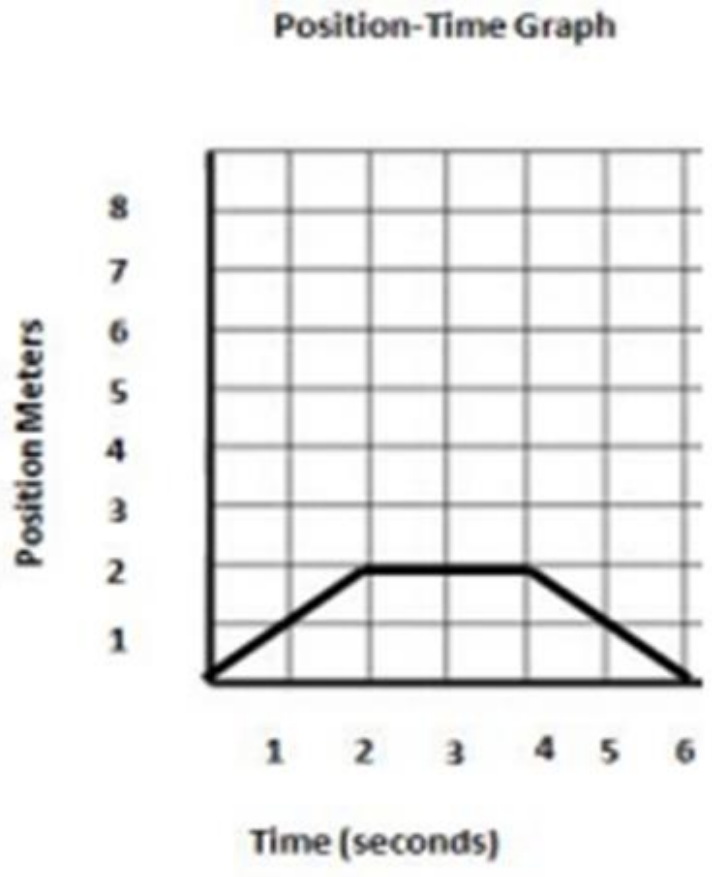
- The motion of an object can be depicted using a time position graph.
- Each second the object is in motion is recorded on the y-axis
- Each meter the object moves is recorded on the x-axis





Time Position Graph

The object moved in the positive direction at a rate of 1 m/s for 2 seconds, then stayed in placed for 2 seconds, and finally moved in the negative direction at a rate of 1 m/s for 2 seconds.



Extra Practice

1. Use the list on the right, which experience balanced forces?

2. Make the motion map for the follow scenario:

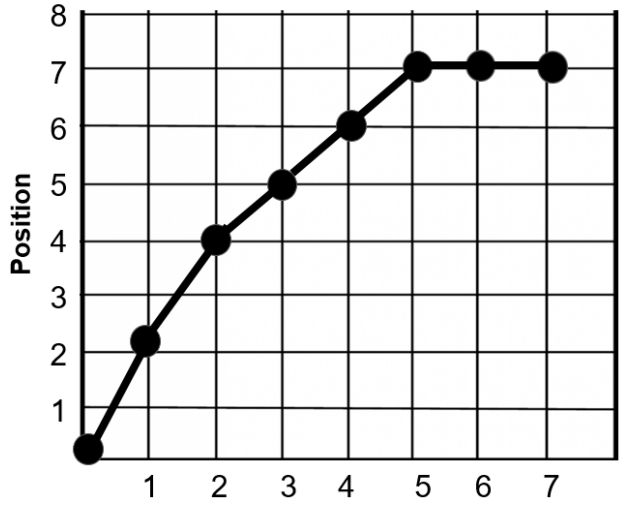
The object moves with a positive velocity at a rate

Of 2m/s for 2 seconds and then decreases its

Speed to 1 m/s for 4 seconds.

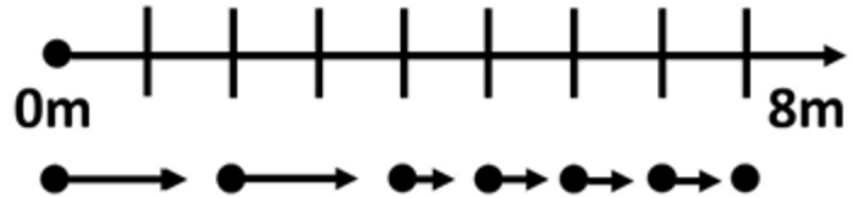
3. Use the graph below to write a scenario and create a motion map.

1. A book sliding across a table at a constant speed
2. A ball sitting on a shelf
3. A can rolling down a ramp
4. A swing moving back and forth
5. A car traveling at a constant speed of 15 m/s
6. A bird landing on a branch



Extra Practice Answers

1. #1 book, #2 ball, and #5 car

2. 

3. A baseball rolls from the origin and travels 4 meters in 2 seconds. Then slows down to 1 m/s for 3 seconds before coming to a stop for 2 seconds.