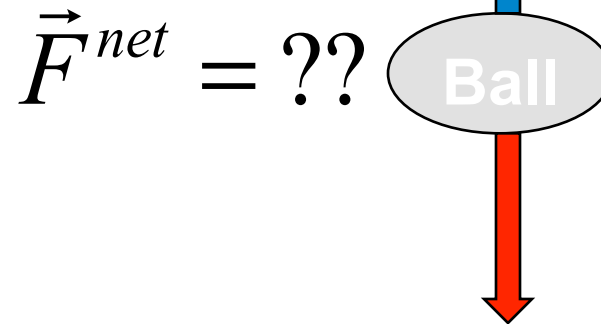
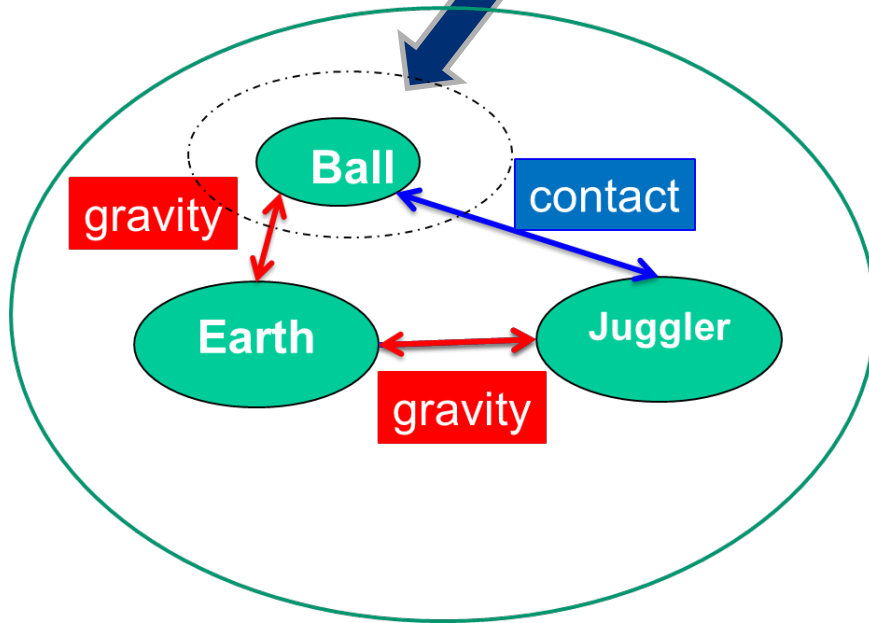


The Free Body Diagram



We want to understand & calculate what causes the motion of one of the objects, **the ball**.

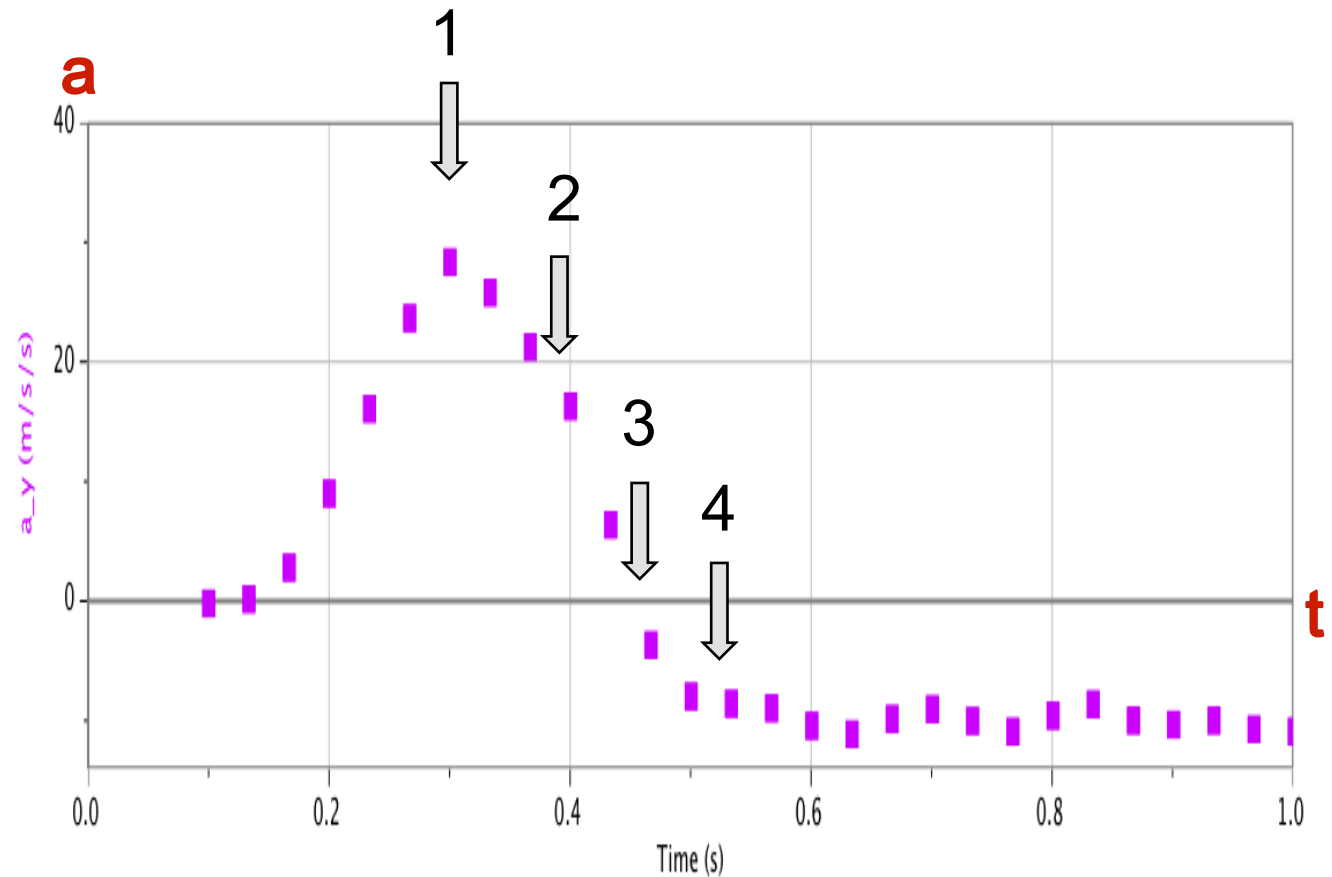
Draw a Free Body Diagram for Ball



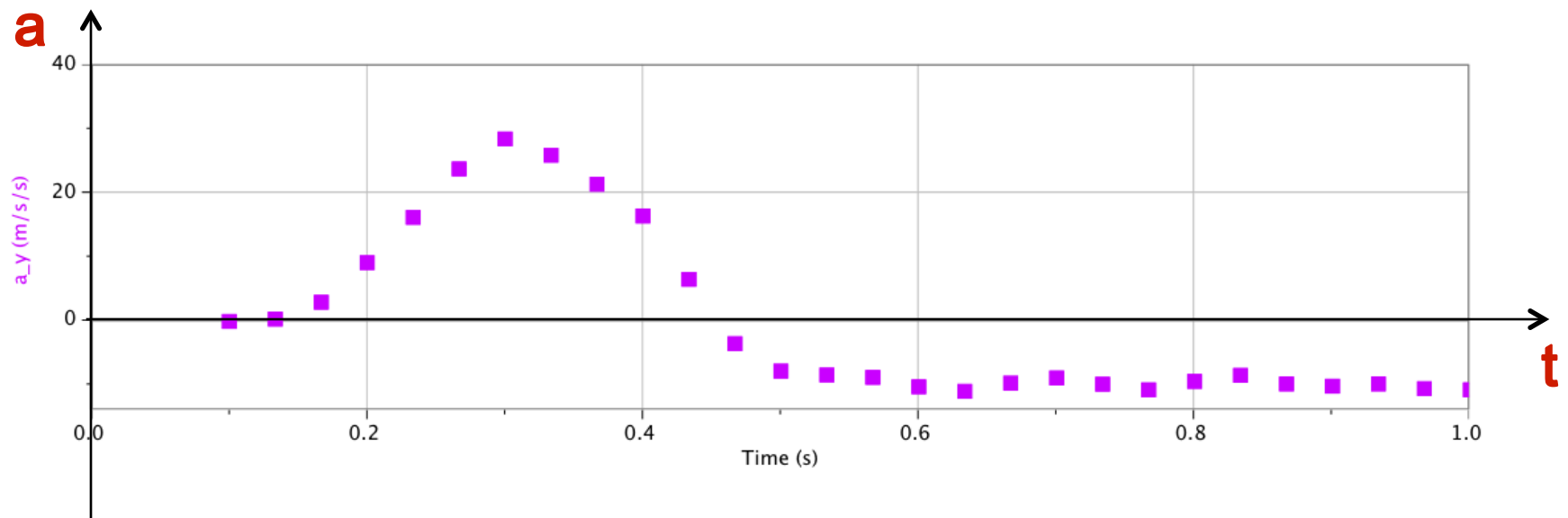
Looking at the acceleration vs time graph, where does the juggler let go of the ball?



- A. At 1
- B. At 2
- C. At 3
- D. At 4
- E. Before 1
- F. After 4



What does the force vs. time graph look like?
What forces are contributing at each time?

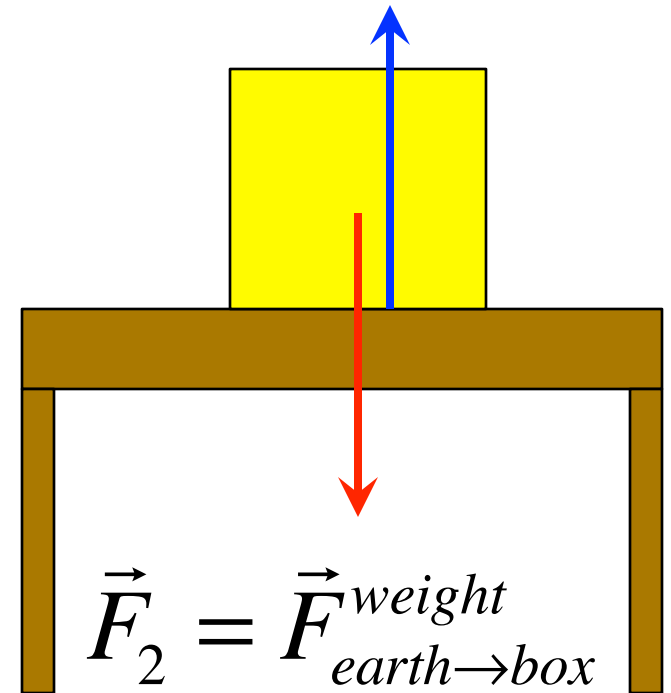


Compare forces 1 and 2



- A. Force 1 is bigger
- B. Force 2 is bigger
- C. They are equal in magnitude
- D. There is not enough information to tell.

$$\vec{F}_1 = \vec{F}_{table \rightarrow box}^{normal}$$



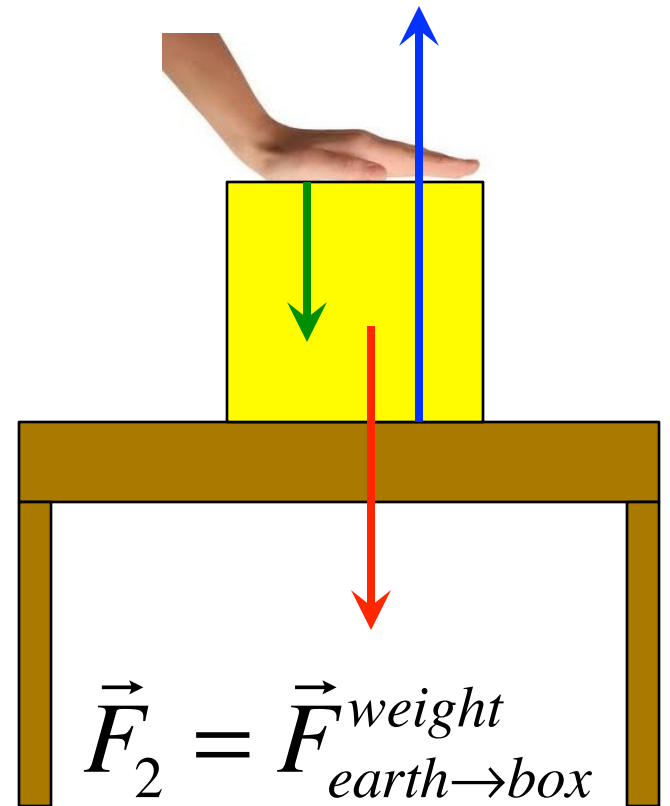
$$\vec{F}_2 = \vec{F}_{earth \rightarrow box}^{weight}$$

Compare forces 1 and 2



- A. Force 1 is bigger
- B. Force 2 is bigger
- C. They are equal in magnitude
- D. There is not enough information to tell.

$$\vec{F}_1 = \vec{F}_{table \rightarrow box}^{normal}$$

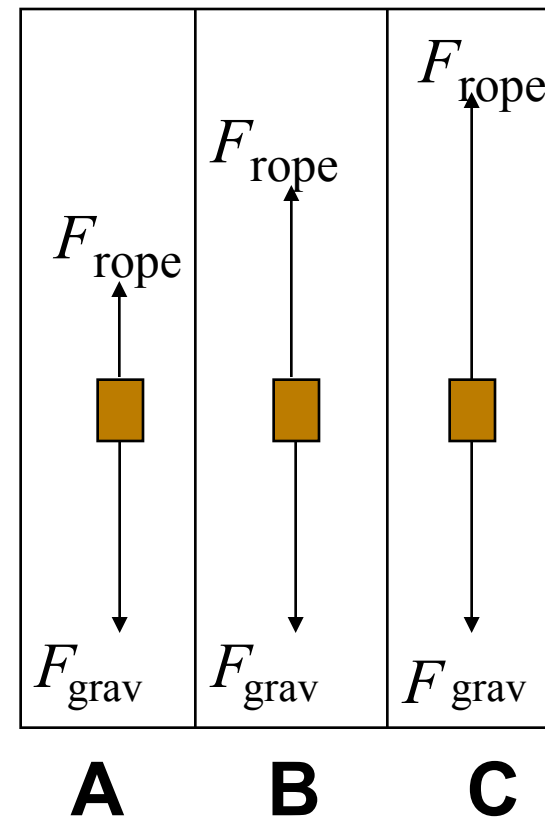


$$\vec{F}_3 = \vec{F}_{hand \rightarrow box}^{normal}$$

$$\vec{F}_2 = \vec{F}_{earth \rightarrow box}^{weight}$$

What's that Lassie? Timmy's in the well?

Suppose Timmy is being pulled up from the bottom of the (dry) well by a rope. **When he is already moving and is going at a constant speed**, which is the correct free-body diagram for Timmy?



What's that Lassie? Timmy's in the well?



Suppose Timmy is being pulled up from the bottom of the (dry) well by a rope. **When he is starting to move and is speeding up,** which is the correct free-body diagram for Timmy?

