First Steps...

- Tracker is a tool that allows to analyze objects in motion to analyze parameters such as: position, velocity, acceleration, in 1 and 2 dimensions.

- To use it, start by downloading the program here: [http://physlets.org/tracker/](http://physlets.org/tracker/)

- As you can see, the software is available for popular platforms (Apple and Windows).
Let’s record a video…

- To use Tracker, you’ll need to have a video of a moving object. It doesn’t matter what object or what type of motion is described, just follow these recommendations:

1. Make sure your background is monochromatic and static, and not full of different objects (trees, people, buildings). Look at the example image.

2. Use a camera with good resolution.

3. Tracker does its job very well, but using a background with these characteristics you can help it do its job even better. Look how on the example image there are several reflections; but it’s better if they’re only reflections, without using the crystal wall as background.
Let’s record a video...

- You can think of a ball, a rocket, or any other moving object.

4. Make sure the object (ball or other) has good contrast with the background.
5. When you record the video, the camera has to remain static, so try to make several rehearsals to place the camera in the correct position. The static camera has to film the entire trajectory.
6. If possible, record from the ground level, trying to film only the object and the static monochromatic background.

You’re ready to record the video!
Video import...

Once you've followed all the previous recommendations, you can now import your video to Tracker to start edition.

1. Open Tracker, and you'll see a screen as in Fig. 1.
2. Use the Video menu and click on Import. You can also do it from the File menu.
3. If your video imported correctly, you should be able to see it on the screen. Video controls will appear to play or stop playback.
4. Notice that when the video is played, the red numbers start to change. That is the frame number of your video. You must later identify the frames of interest for your video.
Video edition...

- Now you can start editing on Tracker.

1. Start by identifying the start frame and final frame of your video. Remember you’re interested in the exact moments the object starts moving (initial frame) and ends moving (final frame). It’s very likely your video doesn’t start with the motion of the object at frame 0, that’s why you have to let Tracker know the frame interval you’re interested in.

2. To do this, use the black triangles appearing below the playback timeline of the video (Figure 1). Move them using the cursor to set the initial and final frames you want to analyze.

3. If you did it correctly, now when you click ‘play’, the video will start on your initial frame and end on your final frame.

4. Go to the Track menu and select New and then Point Mass. You’ll see that a graph and a White table appear automatically on the right part of the screen.

5. Press the keys Command + Shift (Apple) or Control + Shift (Windows) and you’ll notice the cursor changing shape to look like a square.

6. Holding the keys pressed, move the cursor to place it over the object that’s being analyzed, and click on it. You’ll see an icon that shows the position ‘0’ (zero) of the ball.
7. Repeat the previous step until finishing with all frames. You'll notice that each time you click the Command + Shift + Click function an icon progressively appears with the position number (0, 1, 2, etc.).

8. You must repeat until reaching the final frame. Figure 1.

9. Notice that now a graph and table (on the right side of the screen) have been created describing the motion of the object. Figure 2.

10. Now you have at your disposal different tables and graphs that you'll later use to perform some analysis. Figure 3.

11. Consult the video that has been prepared as part of this tutorial to watch the explanation on Tracker.

12. You can also consult other videos if you want to.