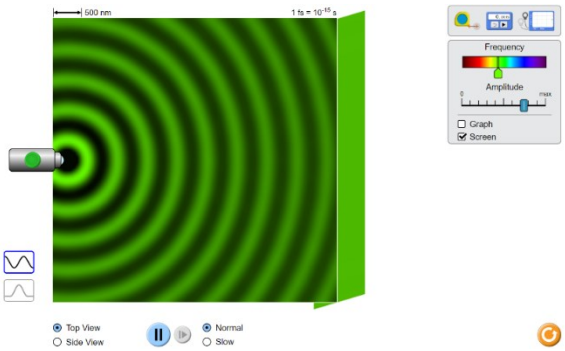
PhET Intro to Waves, Part III: Light

Name:	Period:
Date:	Assignment #:

Visit http://bit.ly/366gs80 & choose **Light.**

Click the Screen box in the control panel.



31. Set the frequency to a bright color of your choice and turn up the amplitude fairly high. It will take a while for the bright waves to hit the screen. When this happens is the screen bright or dark?

32. Turn the amplitude down to almost zero and wait for the smaller waves to hit the screen. Based upon your understanding of amplitude, explain the screen darkens.

33. Turn the amplitude totally down for a few seconds and then back up. What do you observe about the waves and the screen when the amplitude is zero? Explain why this happens.

34. Let's look at wavelength and frequency. Slide the frequency to green, run it until the screen is filled, then Pause it. Use the tape measure to measure the wavelength. What number did you read, and in what units is it measured?

35. Measure the wavelength from one crest to another crest, then from one trough to another trough. Are the numbers identical, very close, or not at all close?

36. Move the frequency to the deepest red you can get and measure the wavelength (you will want to Pause it when the screen is full of red).

37. To get a more precise answer, measure the distance across 5 wavelengths and divide that by five to get the average. How does this compare to your measurement in Step 36? Which one do you think is more precise? Explain why.

38. Now move the frequency to the farthest violet you can get, run the waves, then Pause when the screen is full of violet. Use the method from Step 37 to measure and record the wavelength.

39. A typical figure for visible violet is around 280 nanometers (the *nano* prefix means **1 billionth** !!!). Can you think of the common name for a wave type that is invisible to humans that is *just beyond* violet? (Hint: It starts with a "u," and includes the word 'violet.')

A character from a two-star 2006 movie

40. The wavelength of the deepest red that humans can see is about 700 nm. Is this close to what you got in Step 37? Can you think of the common name for a wave type that is invisible to humans that is *just beyond* red? (Hint: It starts with an "i," and includes the word 'red.')

41. Flip back and forth between 'top view' and 'side view.' Based upon these two views, describe the shape of a light emission.

42. The abbreviation for the basic colors of the spectrum is **ROYGBIV** (often pronounces *Roy-G-Biv*). Does this go in order of increasing wavelength or increasing frequency?

Honors Extension I: What is the relationship between IR rays and heat? (Look it up.)

Honors Extension II: UV rays are more dangerous to humans than IR rays. Why is this true? (Look it up and explain.)