Student Link

Lesson Activity for Grade 8

Science: Optics

Student Name:

INSTRUCTIONS

1.	Grade 8 Door > Science & Technology > Optics column > CD Players
2.	On the left of the screen in the "Explanations" column, click 'Electronics'
3.	Scroll down to and click "Home Audio and Video"
4.	Click 'Audio' section, click "How CDs Work"

5. Read the section **"Introduction to How CDs Work"**

6. Click the link **"Understanding the CD: Material"**. Read the article.

How many bytes of information are on a CD? _____

What is the base material for a CD? _____

How thick is it? _____

State the four (4) steps in creating a CD

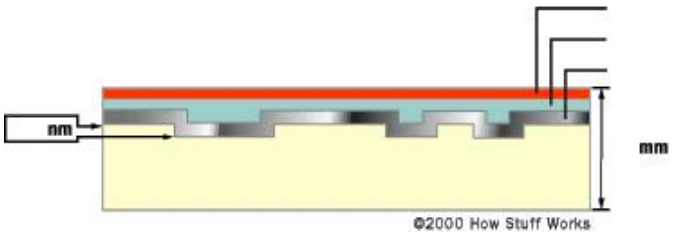
1.) _____

2.) _____

3.) _____

4.) _____

Cross Section of a CD – Label the diagram



Think about it… where is the music (data)?

_____

_____

_____

7. Click the link **"Understanding the CD: The Spiral"**. Read the article.

How many spiral tracks are on the CD? _____

How wide is each track? _____

How much space is between tracks? _____

How big is a micron? _____

Draw a line 6 microns long.

Label the 'CD Track' diagram below.

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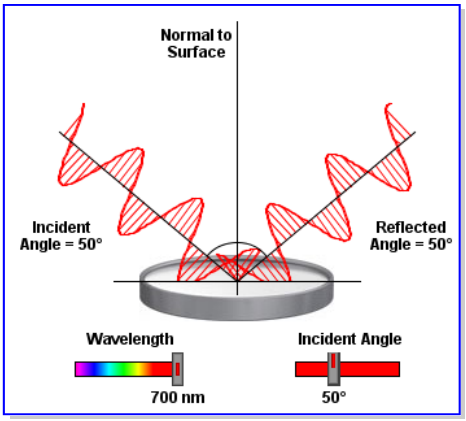
8. Click the link **"Understanding the CD: Bumps"**. Read the article.
How long would the spiral track be if you could take it off the CD and lay it flat? _____
Why do you need an incredibly precise disc-reading mechanism? _____
_____

Think about it… what mechanism would be that precise? _____

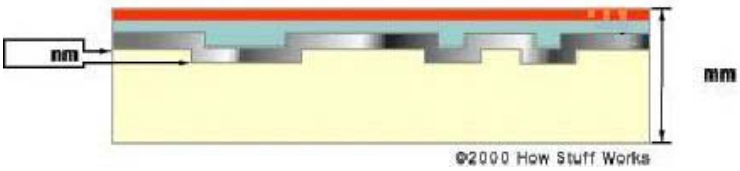
9. Click the link **"CD Player Components"**. Read the article.
Name the three (3) fundamental components of a CD player
1.) _____
2.) _____
3.) _____

10. Click the link **"What the CD Player Does: Laser Focus"**. Read the article.
What is the fundamental job of the CD player?
_____

Open a new browser window. Visit the web site **http://micro.magnet.fsu.edu/primer/java/scienceopticsu/reflection/index.html** and review the **"Angle of Reflection"** article. Try changing the Incident Angle using the slide bar on the right. Notice the relationship between the angle of incident and the reflected angle.



Using a protractor and the diagram below, draw the process of the laser reading the bumps.
HINT; you will have to add the laser and opto-electronic sensor. Remember the 'Rules of Reflection'.



11. Describe the process above.
_____
_____
_____
_____

12. What does the opto-electronic sensor detect? _____
What creates this change? _____
_____
_____

Think about it… will the laser always reflect at the same angle?