

LUXEMBURG-CASCO DISTRICT SCHOOLS

Activities for ET-L200
Laser Trainer

Student workbook has experiments, procedures and objectives for each lesson. Activities take about 8 - 10 days to complete.

Laser purchased from
EDU-TEC Inc.
7070 Brooklyn Blvd.
Brooklyn Center, Minn.
55429
cost about \$500.00

ACTIVITY 1

NAME _____

POSSIBLE POINTS 10

YOUR SCORE _____

1. CLASSIFICATION OF LASER _____

INJURY PRODUCED _____

9. BEAM DIAMETER IN LIGHTED ROOM AT 5 feet. _____

BEAM DIAMETER IN DARK ROOM AT 5 FEET. _____

IS THE BEAM DIAMETER DIFFERENT IN A LIGHTED AREA THAN IN A DARK AREA? _____

IF SO WHY? _____

10. BEAM DIAMETER IN LIGHTED AREA AT 20 FEET. _____

BEAM DIAMETER IN DARKENED AREA AT 20 FEET. _____

IS THE BEAM DIAMETER DIFFERENT IN A LIGHTED AREA THAN IN A DARKENED AREA? _____

IF SO, WHY? _____

dark room at 20' dark room at 5'

11. $\text{TAN } \theta = \frac{D_2 - D_1}{\text{range (in inches)}} =$

THE ANGLE OF DIVERGENCE IS _____

ACTIVITY 2

NAME _____

POSSIBLE POINTS 16

YOUR SCORE _____

2. THE LASER BEAM DIAMETER IS _____ INCH.
_____ IN. X 2.54 = _____
3. THE AREA OF THE BEAM SPOT IS _____ SQ CM.
4. THE IRRADIANCE IS _____.
6. THE METER INDICATES _____ mW.
7. THE METER INDICATES _____ mW.
8. DETECTOR MEASUREMENT _____
9. THE IRRADIANCE IS _____ mW/sq cm.
10. THE IRRADIANCE IS _____ mW/sq cm.

Activity 3

NAME _____

Possible Score _____

4. Why no shadow? _____

9. Observe the beam pattern and draw the pattern in the space provided below:

10. Did the beam pattern change? _____

ACTIVITY 4

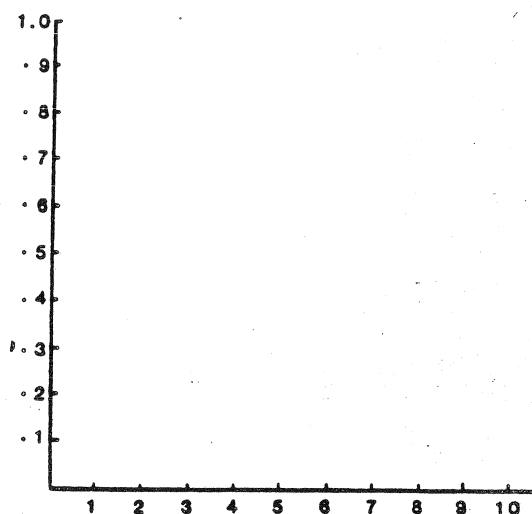
NAME _____

POSSIBLE POINTS **36**

YOUR SCORE _____

DISTANCE IN mm	RELATIVE POWER
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

RELATIVE
POWER
READING



12. peak power is _____ mW

13. peak power $\times 1/e^2 =$ _____ mW

14. Beam diameter is _____ mm.

DISTANCE ACROSS BEAM
IN MILLIMETERS

ACTIVITY 5

NAME _____

POSSIBLE SCORE 6

YOUR SCORE _____

10. Observe the laser beam

is the laser refracted? _____

if so, does it bend toward or away from the normal
of plane 2? _____

do the results agree with what you have learned in
unit 4? _____

NAME _____

EXPERIMENT 7

POSSIBLE POINTS 14

YOUR SCORE _____

6. FOCAL LENGTH IS _____ IN.
FOCAL LENGTH= _____ IN. X 2.54
= _____ cm
7. THE DEPTH OF FIELD IS _____ IN. OR _____ cm
10. DO THE DOTS IN THE PATTERN APPEAR TO BE MOVING WITH OR AGAINST THE MOVEMENT OF YOUR HEAD? _____
12. THE DOT PATTERN APPEARS TO MOVE _____ WITH THE MOTION OF THE EYE.
13. THE PATTERN APPEARS TO MOVE _____ THE MOTION OF THE EYE.

NAME _____

EXPERIMENT 8

POSSIBLE POINTS 5

YOUR SCORE _____

6. IS THE BEAM SPOT FROM THE COLLIMATED BEAM SMALLER THAN THE BEAM SPOT FROM THE UNCOLLIMATED BEAM? _____

WHAT IS THE RATIO OF THE SMALLER BEAM TO THE LARGER BEAM? _____

9. IS THE DIAMETER OF THE OUTPUT BEAM FROM THE COLLIMATOR GREATER OR LESS THAN THAT OF THE INPUT BEAM? _____

WHAT IS THE RATIO OF THE DIAMETER OF THE OUTPUT BEAM TO THE DIAMETER OF THE INPUT BEAM? _____

10. DOES THE DIAMETER OF THE BEAM DECREASE AS IT IS MOVED CLOSER TO THE LASER? _____

NAME _____

EXPERIMENT 9

POSSIBLE POINTS 6

YOUR SCORE _____

9. Answer the following:

With the lens holder in position 1, what is the angle of the incident light from the laser beam?

With the lens holder in position 2, what is the angle of the incident light? _____

What do you estimate will be the angle at the intersection of the two lines at Point A? _____

10. Measure the angle at the intersection of the two lines that you drew at point A.

The angle is _____

Does this confirm your estimate of the angle step 9?

How do you explain the size of this angle? _____

NAME _____

LASER SCORE SHEET

YOUR SCORE

EXPERIMENT 1	POSSIBLE	10	POINTS	_____
EXPERIMENT 2	POSSIBLE	16	POINTS	_____
EXPERIMENT 3	POSSIBLE	6	POINTS	_____
EXPERIMENT 4	POSSIBLE	36	POINTS	_____
EXPERIMENT 5	POSSIBLE	6	POINTS	_____
EXPERIMENT 7	POSSIBLE	14	POINTS	_____
EXPERIMENT 8	POSSIBLE	5	POINTS	_____
EXPERIMENT 9	POSSIBLE	6	POINTS	_____
QUESTIONS		13	POINTS	_____
TOTAL POSSIBLE		112	points	_____