Name: _____

Learning Goal:

- Distinguish observational studies from experiments.
- Identify explanatory, response, and potential confounding variables in a study.
- Identify features of experiment design that control the effects of confounding variables.

(This activity is adapted from an activity by Beth Chance and Allan Rossman in *Workshop Statistics*.)

1) Near-sightedness typically develops during the childhood years. Recent studies have investigated a possible association between near-sightedness and the use of night- lights with infants. In a study by Quinn, Shin, Maguire, and Stone (1999), researchers surveyed parents of 479 children visiting a pediatric ophthalmology clinic. One of the questions was "Under which lighting condition did/does your child sleep at night?" before the age of 2 years. The parents chose between "room lighting," "a night light," and "darkness." Based on the child's most recent eye examination, researchers separated the children into three groups: near-sighted, normal refraction, or far-sighted.

a) Who are the individuals of interest in this study?

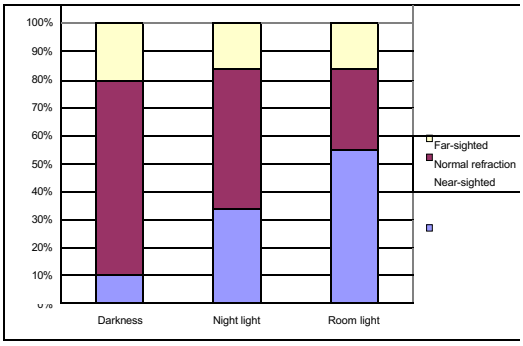
b) What is the explanatory variable in this study? Is it quantitative or categorical?

c) What is the response variable in this study? Is it quantitative or categorical?

d) Is this an observational study or an experiment? How can you tell?

The following table and graph display the data from this study.

	Darkness	Night light	Room light	TOTALS
Far-sighted	40	39	12	91
Normal refraction	114	115	22	251
Near-sighted	18	78	41	137
TOTALS	172	232	75	479



e) What does the data suggest about the association between near-sightedness and higher levels of light exposure? Support your answer.

f) Is it valid to conclude that sleeping in a lit room or with a night light **causes** an increase in a child's risk of near-sightedness? Why or why not?

g) Identify at least one confounding variable. Explain how this variable might be responsible for the association we see between the explanatory variable and the response variable in this study.