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| --- | --- | --- | --- |
| Question: | How does a bald eagle population change across three decades at a winter migratory stopover? | Do cold air temperatures influence bald eagle abundance? | Do salmon numbers influence the bald eagle abundance? |
| Hypothesis (If): |  |  |  |
| Experimental Design |  |  |  |
| Independent variable(s): |  |  |  |
| Dependent variable(s): |  |  |  |
| Type of graph: |  |  |  |
| Type of statistical analysis: |  |  |  |

Draw your three figures. On each, label both axes, including measured units and add predicted results.

**GLOSSARY FOR THE SCIENTIFIC PROCESS**

**Data** – Small amount of information about the subject of an investigation.

**Continuous Data** – Points taken along a scale that can be infinitely subdivided (think decimals). Time, weight, and temperature are examples. Also called ordinal data.

**Categorical Data** – Each point falls into a non-numeric group or category, *e.g.*, male or female. Also called nominal data.

**Discrete Data** – Each point can be only a whole number. Cats would be discrete units because there is no possibility of a fraction of a cat. We count or tally these data.

**Experimental Design** – The formal design worked out to test the prediction of a hypothesis.

**Independent Variable** – The factor to be varied by direct manipulation by the investigator or by natural categorization in the experiment. It is expected to cause an effect in the dependent variable. In a graph this variable occurs on the x (horizontal) axis.

**Dependent Variable** – The variable whose response we measure in the experiment. It is expected to result from variation in the independent variable. In a graph this variable occurs on the y (vertical) axis. It may be a continuous or discrete variable.

**Experimentation** – Methods used to test predictions of hypotheses.

**Manipulation** – Alterations in the independent variable are created by the investigator.

**Observation** – Natural variation in the independent variable occurs, requiring no alteration, only direct observation of the dependent variable by the investigator.

**Graph (Figure) (Chart)** – A diagram that represents the variation of a variable in comparison with that of one or more other variables.

**Axes** – **Horizontal** (x axis, abscissa) for independent variable(s).

 **Vertical** (y axis, ordinate) for dependent variable(s).

**Caption** – A short description accompanying the graph that includes some form of reference to the axes and sample size. Sometimes called a legend.

**Bar Graph** – Used when the independent variable is categorical (otherwise known as Column Graph).

**Line Graph** – Used when the x axis represents a continuous variable. Sometimes the x variable is the independent variable. Other times, as in showing a correlation, neither x nor y variables are designated as independent or dependent variables.

**Hypothesis** – A formal statement of a possible explanation for an observed phenomenon. A “might-be” about the way the world works. It leads to predictions.

**Prediction** – A consequence expected by the logic of the hypothesis and basis of the experimental design.

**Assumption** – A fact that is taken-for-granted in the experiment. If the experiment fails to falsify the hypothesis, the assumption may not have been true and they may need to be tested.