

Proportional Relationships in Biology

Bell Ringer...

1) Are $\frac{2}{3}$ and $\frac{6}{12}$ proportional?

1) No; $\frac{6}{12} = \frac{1}{2} \neq \frac{2}{3}$

2) Are $\frac{2}{3}$ and $\frac{10}{15}$ proportional?

1) Yes; $\frac{2}{3} = \frac{(2*5)}{(3*5)} = \frac{10}{15}$

3) Are $\frac{2}{3}$ and $\frac{4}{9}$ proportional?

1) No; both are simplified

Proportional Shapes

- What does it mean for two shapes to be similar or proportional?
- Same shape, different size.



Photo by Simon Stump

Proportional Shapes

Height=4



Width = 4

Width=4



Height
= 10

Width = 10



Height=10

Proportional Relationships in Biology

- In biology, some relationships are proportional, and some are not.
- This will sometimes tell us something about the organism.

Proportional Relationships in Biology

- Does body shape change with age?
- Is a human baby proportional to a human adult?



Smaller Heads

Proportional Relationships in Biology

- In frogs, a small frog and a big frog do look the same...



Photo credit: Simon Stump

Proportional Relationships in Biology

- Which has proportionately bigger legs: an ant, or an elephant?
- An elephant is 3.3 m tall, and has a foot 0.5 m wide.
- An ant is 4 mm tall, and has a foot 0.06 mm wide.



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Proportions in plants

- Are large and small plants proportional?



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