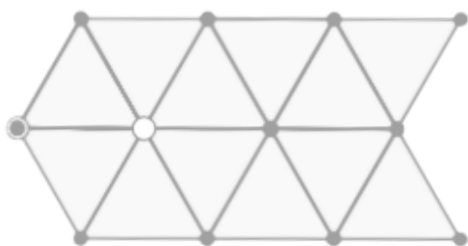


Ri Off the Shelf Masterclass: The mathematics of bees

Worksheet 4 – How much wax?!

Below you have three potential honeycomb structures – one from triangles, one from squares, and one from hexagons. Each honeycomb is made of 12 shapes. Use a calculator to work out how many unique edges each honeycomb has, then calculate how much wax and honey has been used to create it.

For 1 gram of wax, 6 grams of honey are used.



Triangles

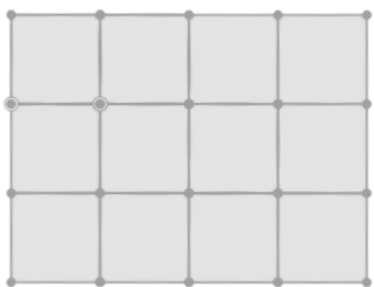
This structure can store 500g of honey. Each edge takes 3g of wax to construct.*

Number of unique edges:

Total amount of wax needed (g):

Total amount of honey used (g):

Honey stored ÷ honey used =



Squares

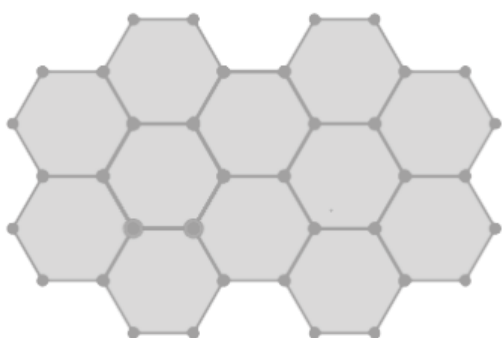
This structure can store 650g of honey. Each edge takes 2.5g of wax to construct.*

Number of unique edges:

Amount of wax needed (g):

Amount of honey used (g):

Honey stored ÷ honey used =



Hexagons

This structure can store 750g of honey. Each edge takes 1.5g of wax to construct.*

Number of unique edges:

Amount of wax needed (g):

Amount of honey used (g):

Honey stored ÷ honey used =

- Which of the shape structures had the best efficiency of storing honey? _____
- Why does sharing cell walls matter? _____

- Which would you pick if you were a bee? _____

*This is just for illustration, typically a single cell may take around 0.01g of wax to construct and store 0.2g of honey.