



# Quarterly Problem

- *Math-Edition* -

## The honeycomb problem

Source: pixabay.com

→ *That honeybees are skillfully building hexagonal honeycomb cells has been well known for centuries. Whoever is lucky enough to see these structures in real life can only be fascinated by the extremely precise construction art of these small insects. The explanation for this is still fascinating the wider scientific community.*

The 'honeycomb conjecture' states that a regular hexagon is the best way to divide a surface into regions of equal area with the smallest total perimeter. The conjecture was proven recently by the mathematician Thomas C. Hales.

- Present a quick overview of the history of the 'honeycomb conjecture'.
- Investigate which of the three shapes (equilateral triangle, square and regular hexagon) provides a solution to the problem. You can do this either in a dynamic geometry environment or with paper and pencil.
- Why the regular hexagon is the only of the above shapes that fulfills the 'honeycomb conjecture'?

### Brainstorm-Box

Explore the world of bees!  
There are so many more fascinating things to learn, like how beehives are organised- How does this tie into this problem?



Source: pixabay.com

## Which is the pattern that fulfills the honeycomb conjecture?

Focus on phrasing your approach in a clear and comprehensible way.

Also state what steps helped you to reach the solution. Justify your ideas/claims.