

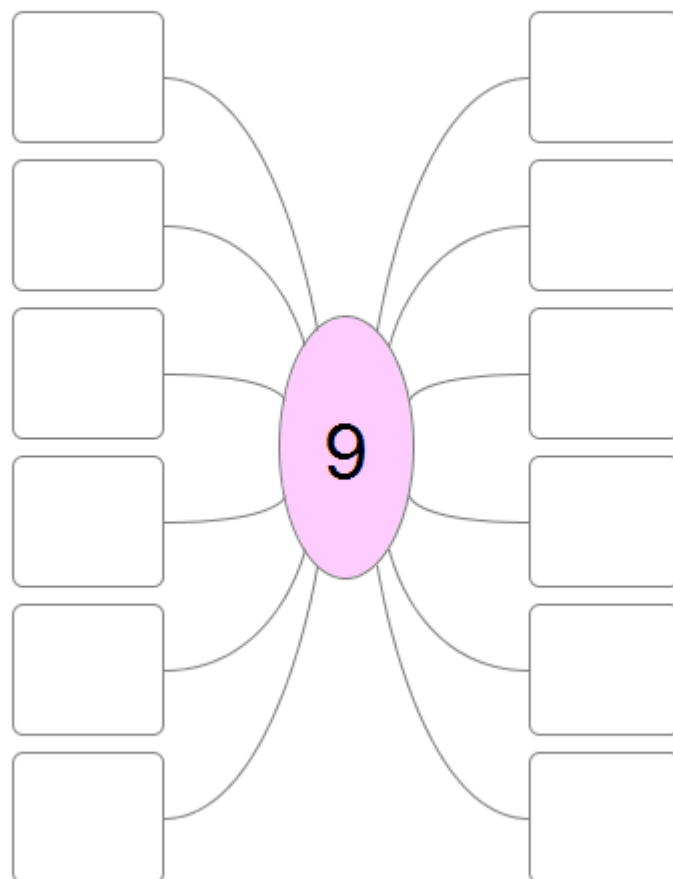
## Indices: Starter Activity

Ask students to:

- Write a number, e.g. 9, in the middle of a sheet of paper.
- Draw a number of lines from it
- At the end of every line write an expression using indices that is equal to 9.

This activity can be done in pairs or small groups. Pairs can then compare diagrams. Each pair checks the others work and asks for justification, adding to their own diagram anything they can. This can lead to whole class discussion with groups explaining one of their equivalences.

This activity can be repeated for other starting numbers or algebraic expressions.



## Indices: Why does?

- Arrange students in pairs and given the following statements.
- Each pair to allocated one of the statements to think about.
- Students then explain to the rest of the class.

1. Why does  $\left(\frac{1}{3}\right)^{-3} = 27$ ?

2. Why does  $10^{-4} = 0.0001$ ?

3. Why does  $4^{\frac{1}{2}} = 2$ ?

4. Why does  $\left(\frac{1}{4}\right)^{-2} = 16$ ?

5. Why does  $\left(\frac{1}{4}\right)^{-\frac{1}{2}} = 2$ ?

6. Why does  $\left(\left(\frac{1}{4}\right)^{\frac{1}{4}}\right)^2 = \frac{1}{2}$ ?

7. Why does  $8^{\frac{2}{3}} = 4$ ?

8. Why does  $4^{\frac{3}{2}} = 8$ ?

9. Why does  $9^{-\frac{3}{2}} = \frac{1}{27}$ ?

10. Why does  $32^{\frac{3}{5}} = 8$ ?