Using algebra as a language

Ordering expressions

Expressions cards

- You have 5 cards, each with a different algebraic expression, involving an unknown, represented by the letter *k*.

$k - 1$	$k^2 + k$	$2(k + 2)$	$2k + 2$	$1 - k$

- You will be shown a slide with a value for *k* to substitute into each expression.
- Calculate the value of each expression and place your cards in order: smallest to largest.

Expressions cards

$$k = 1$$

- Order your cards on your desk , smallest to largest, when $k = 1$.

Solution

$$k = 1$$

$k - 1 = 0$

$1 - k = 0$

$k^2 + k = 2$

$2k + 2 = 4$

$2(k + 2) = 6$

Expressions cards

$$k = -1$$

- Order your cards on your desk , smallest to largest, when $k = -1$.

Solution

$$k = -1$$

$k - 1 = -2$

$k^2 + k = 0$

$2k + 2 = 0$

$1 - k = 2$

$2(k + 2) = 2$

Expressions cards

$$k = 10$$

- Order your cards on your desk , smallest to largest, when k = 10.

Solution

$$k = 10$$

$1 - k = -9$	$k - 1 = 9$	$2k + 2 = 22$	$2(k + 2) = 24$	$k^2 + k = 110$

Expressions cards

$$k = \frac{1}{2}$$

- Order your cards on your desk , smallest to largest, when $k = \frac{1}{2}$.

Solution

$$k = \tfrac{1}{2}$$

$k - 1 = -\tfrac{1}{2}$	$1 - k = \tfrac{1}{2}$	$k^2 + k = \tfrac{3}{4}$	$2k + 2 = 3$	$2(k + 2) = 5$

Expressions cards

$$k = 0$$

- Order your cards on your desk , smallest to largest, when *k* = 0.

Solution

$$k = 0$$

$k - 1 = -1$	$k^2 + k = 0$	$1 - k = 1$	$2k + 2 = 2$	$2(k + 2) = 4$

Expressions cards

$$k = -3$$

- Order your cards on your desk , smallest to largest, when $k = -3$.

Solution

$$k = -3$$

$k - 1 = -4$

$2k + 2 = -4$

$2(k + 2) = -2$

$1 - k = 4$

$k^2 + k = 6$

Expressions cards

$$k = -\frac{1}{2}$$

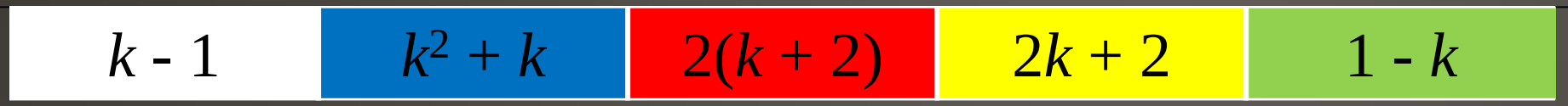
- Order your cards on your desk , smallest to largest, when $k = -\frac{1}{2}$.

Solution

$$k = -\frac{1}{2}$$

$k - 1 = -1\frac{1}{2}$	$k^2 + k = -\frac{1}{4}$	$2k + 2 = 1$	$1 - k = 1\frac{1}{2}$	$2(k + 2) = 3$

Expressions cards: reasoning questions



- Are there any values for k which will make the expressions on the red and yellow cards equal?
- Can you find a value for k which will make the expression $2(k + 2)$ (on the red card) have the smallest value?
- What values for k will make the expression $k^2 + k$ negative?