What if……
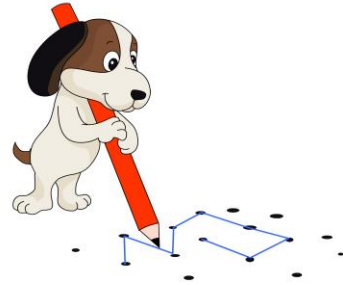
………you had 3 numbers more than 10?   Does your rule still work?

………you had 4 numbers?

Make connections

Digit Dog Challenges

Always, sometimes, never
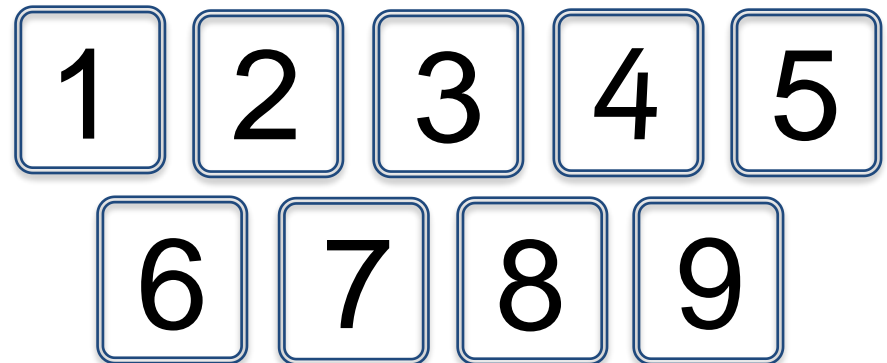
Always true, sometimes true or never true?

If I add 3 numbers less than 10, the answer will be an odd number

1 2 3 4 5

6 7 8 9

To make this challenge more accessible, use Numicon® shapes instead of digit cards. Using Numicon® shapes will help learners to generalize and explain their reasoning.

Engage in the challenge before starting the challenge, let learners discuss what they think the challenge is about. Encourage learners to say what they see and unpick the challenge.

> **What is Digit Dog saying? Explain in your own words. What do we have to find out?**

Encourage learners to comment on each others' explanations: Do you agree with what your friend has just said?

Use *Numicon®* to explain the challenge - if I add 3 shapes less than 10, the total will be an odd number – ask children to choose 3 numbers to add.

Ask: Do you think Digit Dog's statement is true?
Can you choose 3 numbers that show it is true?
Can you find 3 numbers that show it is not true?

> **What are you thinking?**

Calculating Cat said...

> I think it is **always true** because 2 + 4 + 1 = 7 and 7 is odd.

> **What do you think? Do you agree with her? Why/why not?**

> **Do the challenge**

Investigate the totals of 3 numbers less than 10 and record the results.
Ask: How are you going to record your work? What totals have you found? What do you notice about your totals?
Suggest: using post-it notes or pieces of paper to record individual calculations and totals, or use *Numicon* shapes.

> **Organise your work**

Sort the totals into odd and even. What patterns can you see? What have you noticed about the numbers you have added? Are they odd or even? Which numbers have an odd total? Which have an even total?

Be a pattern sniffer

> **Explain your thinking**

Is Digit Dog's statement always true? Sometimes true? Never true? How do you know?
Convince yourself. Convince your friend.

Can you think of a rule that will work for any numbers?

Sort the examples that learners have created into groups, e.g. 3 odd numbers, 3 even numbers, those that make an odd total, those that make an even total, 2 even numbers and 1 odd, 2 odds and 1 even. Think again about Calculating Cat's statement. Do you agree or disagree?
Explain your thinking.