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THE MATHEMATICAL
ASSOCIATION OF VICTORIA

Asking the 'right' question

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Paper plates



Overview



This workshop will focus on the 'craft' of being an effective mathematics teacher. Knowing when to ask the right question to influence students learning experience and ensure that they are engaged in completing a mathematical challenge using creative and critical thinking. In this workshop we will investigate a variety of questioning techniques that may enable or extend students, ensuring they are applying their thinking skills. Participants will be asked to be critical and creative thinkers as we explore their own teaching and learning context.

What is the 'right' question?



Good questions?

Open v closed questions

Rich tasks

Problem solving

Does this argument make sense?

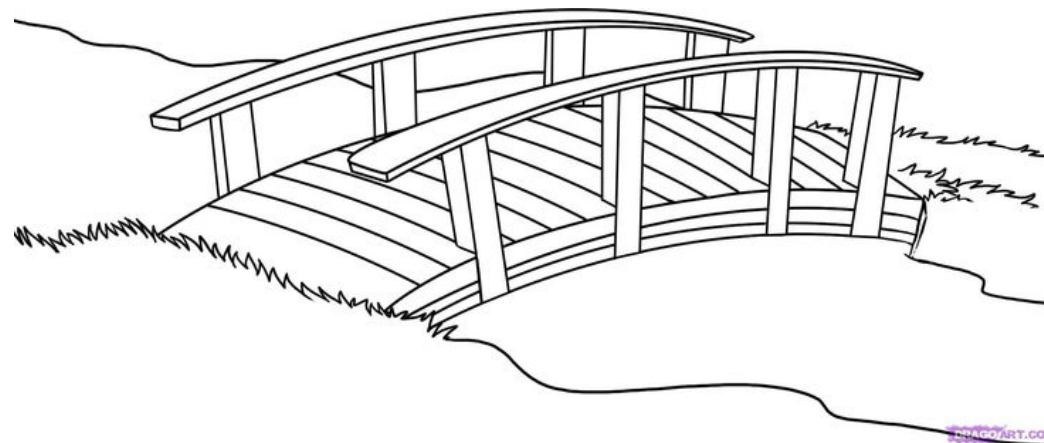


[reSolve PL Module 4 Contrasting Approaches video](#)

Click link to watch video

Enabling and extending prompts

Enabling prompt
think of a bridge



Extending prompt
going further on the same road



Time: teeth brushing

What is something that takes you longer than 1 minute but less than the time it takes you to clean your teeth?

Enabling prompt

- How can you work out how long it takes to brush your teeth?

Extending prompt

- What is a good strategy for estimating time duration without a clock?



Going further



What is something that takes longer than the journey from your home to school but less than 1 hour?

Number chart chess

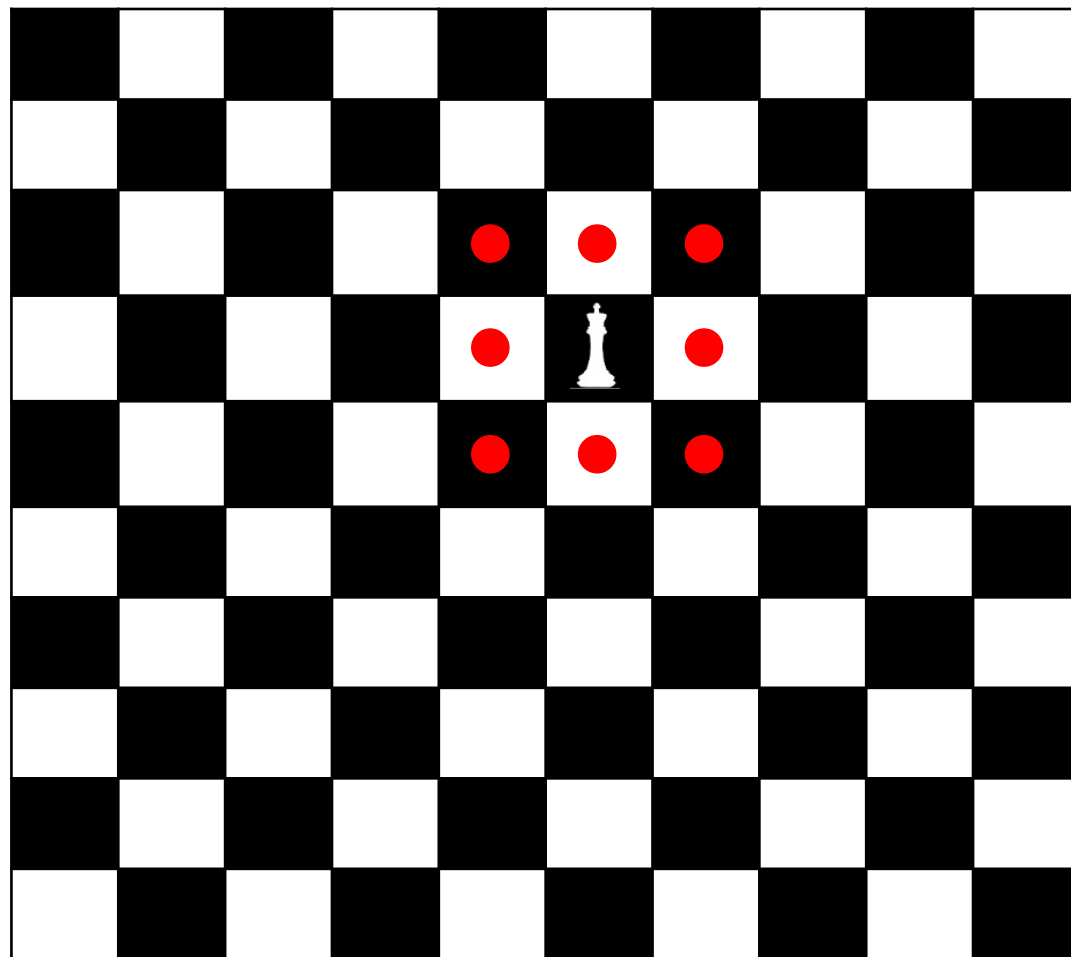


A ReSolve lesson

Lesson 1:

The King In this task, the king has escaped from a regular chessboard onto a hundreds chart. The students explore the moves of the king and how the value of the numbers change as he moves. This builds into an algebraic exploration of equivalent values that can be found on the number chart.

The King



THE KING

The King can move one square at a time in any direction

The King enabling prompts



What numbers on the chart can the King move to if it starts on:

- 12
- 94
- 27
- 50
- 81

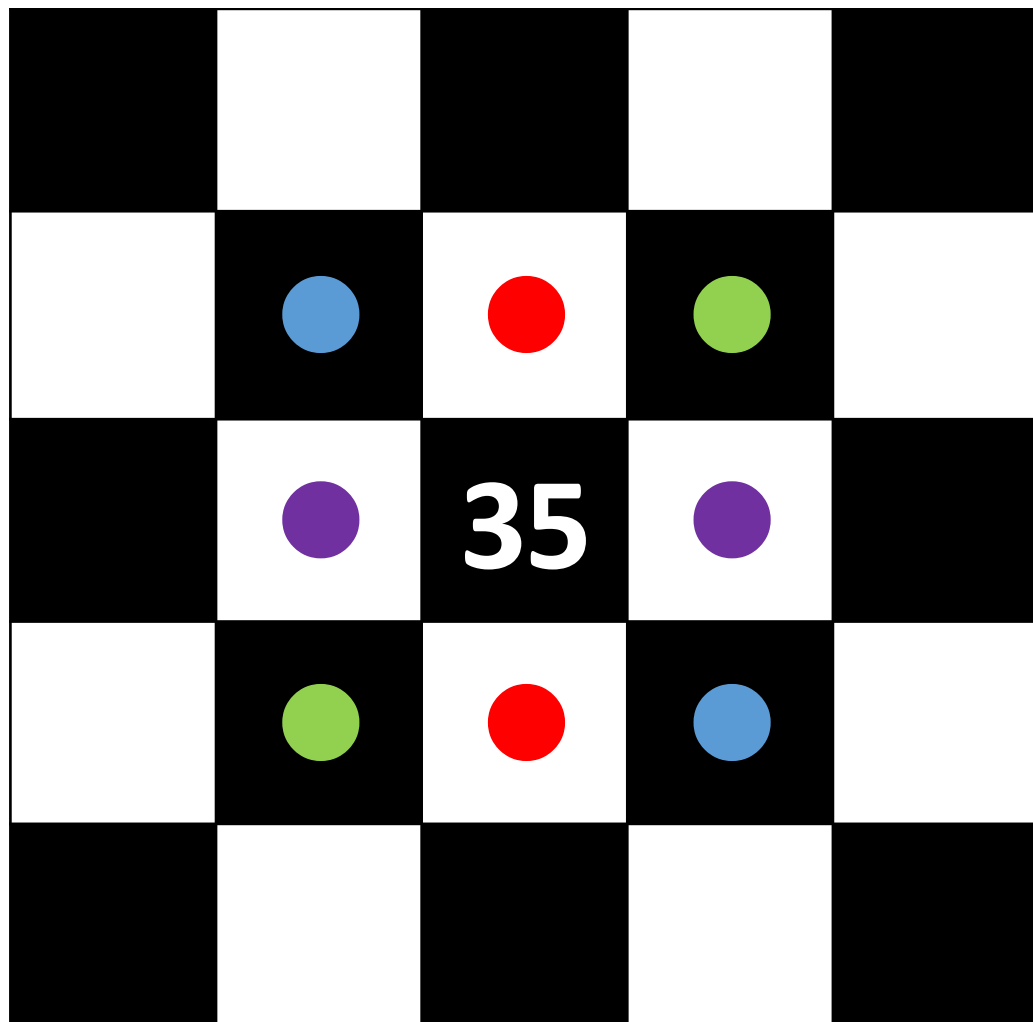
The King



The King can move to 23 and 41.
Where is the king on the chart?

The King can move to 47 and 46.
Where is the king on the chart?

The tens chart relationships

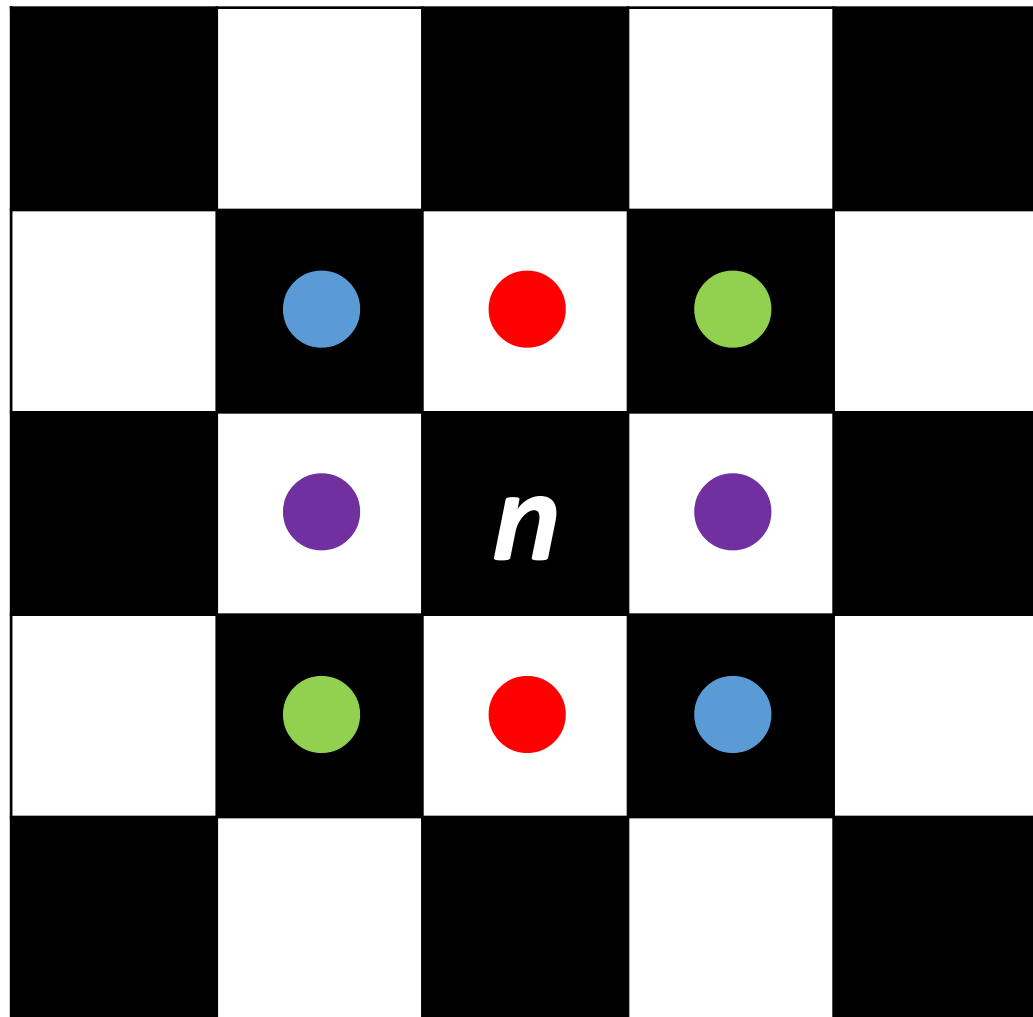


What do you notice?

Can you see a relationship to 35?

Why does this happen?

The King enabling prompts

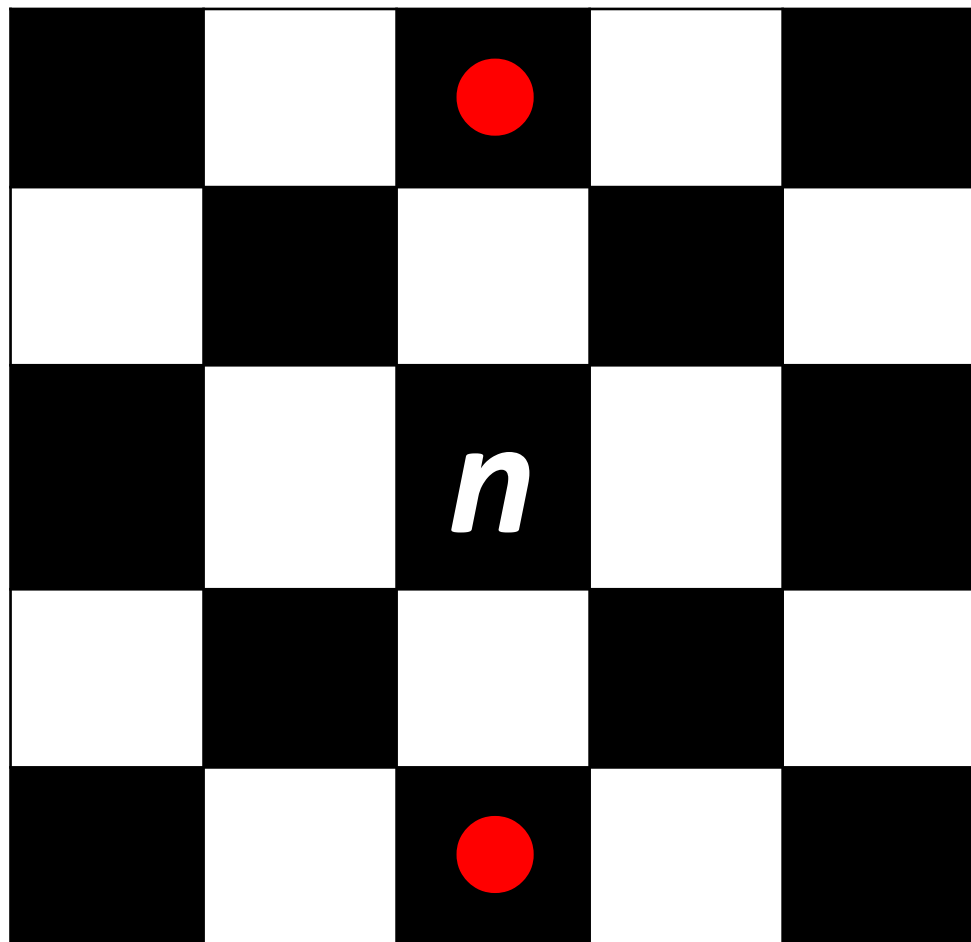


What if the starting number wasn't 35?

Will this happen for any number on the number chart?

n stands for any number on the *number chart*

What now?



Will it still work?

n stands for any number on the
number chart

Writing question prompts



What is the mathematics involved?

What is the developmental sequence of the content?

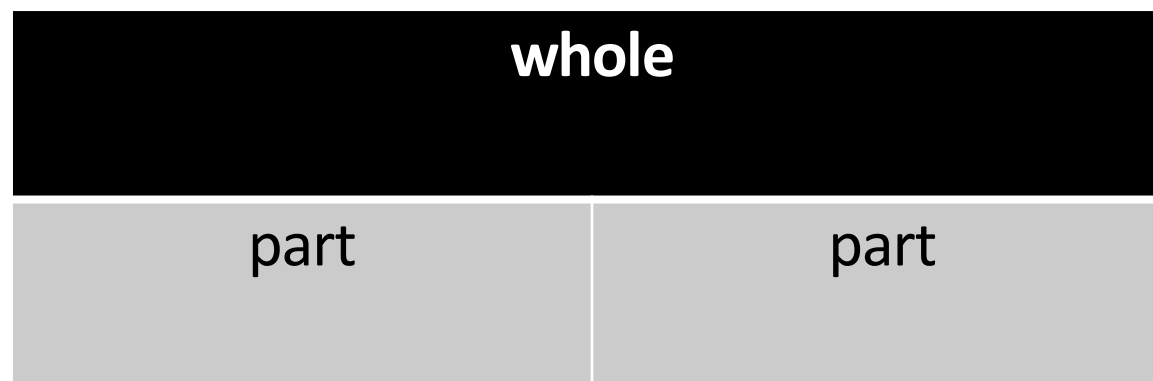
Types of questions

Transparent

Geoff had 6 lollies. He was given two more. How many lollies did he have altogether?

Masked

After going to the beach, Kerry had some lollies. She had 8 altogether after being given 2 more. How many lollies did Kerry start with?



On the farm

- On a farm, there were 31 white chickens and 10 brown chickens. How many chickens are there altogether?
- On a farm, there are 10 chickens. If I want to have 41 chickens, how many more chickens do I need?
- On a farm with 41 chickens, 31 of the chickens are white. The rest of the chickens are brown. How many chickens are brown?



Sullivan 2018

In a plantation

- In a plantation, there are 20 eucalypt trees and 37 wattle trees. How many trees are there altogether?
- In a plantation there are 57 trees – some are eucalypts and some are wattle. If I have 37 eucalypt trees, how many wattle?
- In a plantation, there are 20 eucalypt trees and 57 trees altogether. If the rest of the trees are wattles, how many wattle trees are there?



Sullivan 2018

Veggie garden

- We are growing tomatoes and capsicums in the vegetable garden. There are 52 plants altogether. If there are 32 tomato plants, how many capsicum plants are there?
- We are growing tomatoes and capsicums in our veggie garden. If there are 32 tomato plants and 20 capsicum plans, how many plants are there altogether?
- I want to grow 52 plants in our veggie garden. If I already have 20 plants, how many more plants do I need?



Questions



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