

Teacher's Guide for the Preparation Tasks

This year, APSMO is introducing new activities to support students in exploring maths through problem solving.

These tasks focus on strategies and experiences that assist students in building familiarity with mathematical concepts and support collaboration and communication during maths lessons. They are also designed to help teachers tailor activities for high potential and gifted students. As such, not every Preparation Task is suitable for every student.

In this Kit, there are 4 Preparation Tasks.

Each task requires 2 resources to be used together:

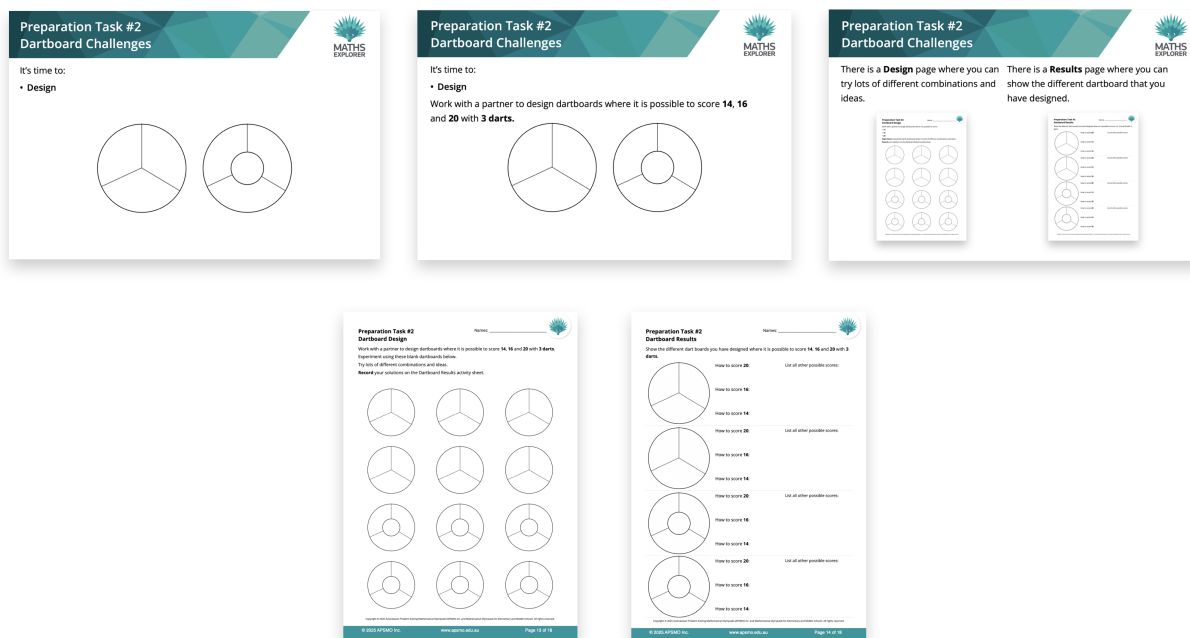
- Preparation Task Slides to display on a screen and
- Accompanying student activity sheets.

This allows teachers to guide their class through the steps of each task tasks.

The activity sheets are included in this document, starting on Page 12.

The Preparation Task Slides are in a separate PDF, ready to download in the portal.

For example, Preparation Task #2 includes 3 slides and 2 activity sheets.



As previously noted, teachers can select with discretion which tasks they select to complete with their whole class, and put some more challenging activities aside for smaller groups of children to complete collaboratively.

Preparation Task #1 Dartboard Challenges

Names: _____



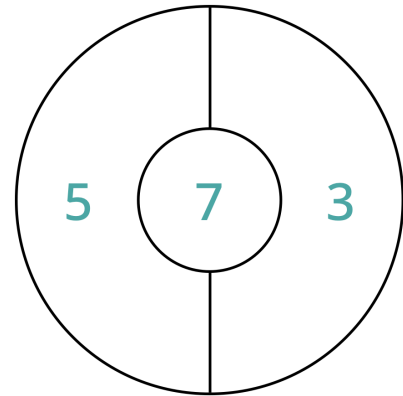
Rebekah and Sung are working together to solve a problem.

In this problem, 3 darts will land somewhere on the board and earn points.

Their teacher wrote some possible scores up on the whiteboard:

17 11 23 9 14 19

Right away, Sung said, 'There's **no way** someone could score **14**.'



Think about the 3 numbers on the dart board.

Explain how Sung new right away that 14 is an impossible score.

Find the other score in the list that is impossible to get.

Prove that there is no way to get that score.

Make a list of all scores that are possible when 3 darts land on the dartboard.

You might like to organise them from the **lowest** to **highest** score.

Find scores that you can get in more than one way.



Preparation Task #2

Dartboard Design

Names: _____

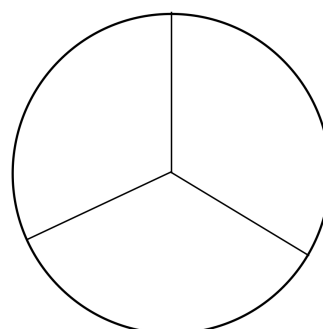
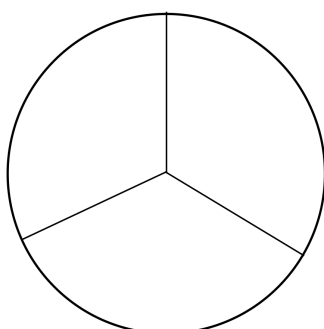
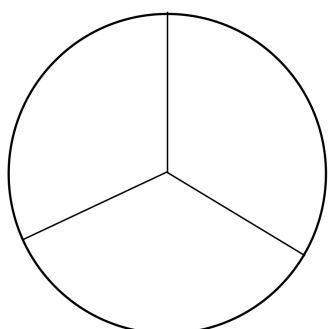
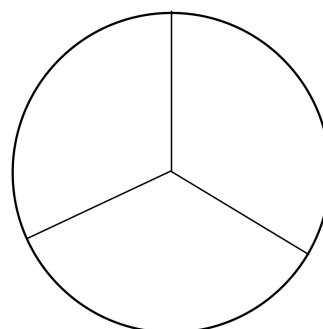
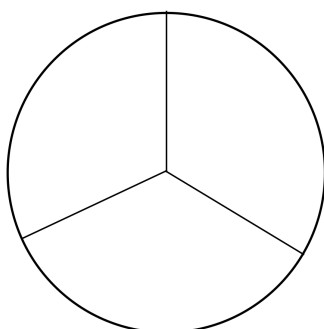
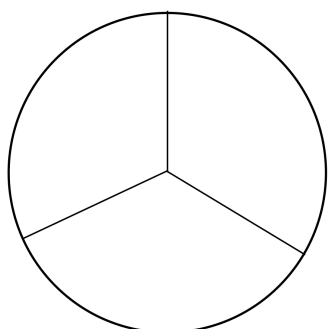
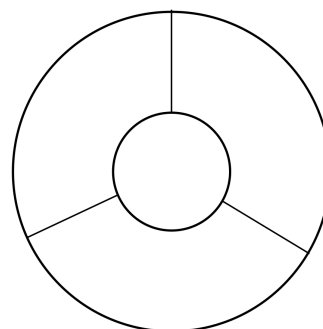
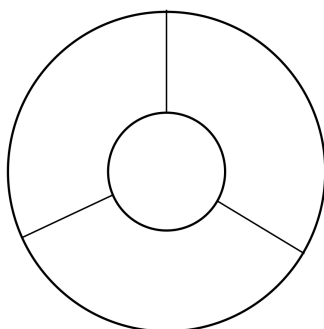
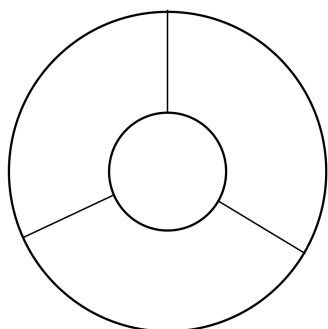
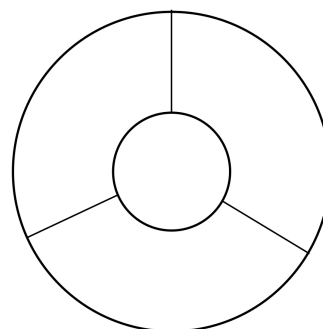
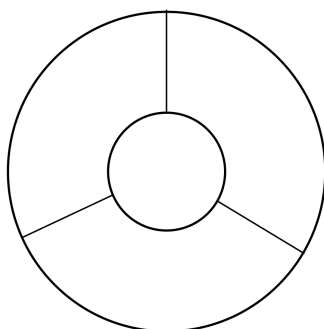
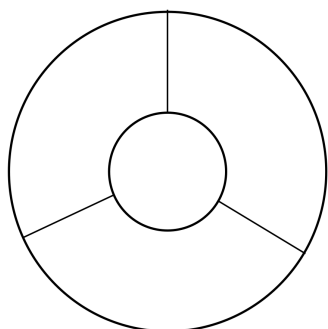
Work with a partner to design dartboards where it is possible to score **9, 14** and **21** with **3 darts**.

Experiment using these blank dartboards below.

Try lots of different combinations and ideas. The first type of dartboard gives you 4 regions to use with 3 darts.

The second type only has 3 regions that you can use to score the totals with 3 darts.

Record your solutions on the Dartboard Results activity sheet.



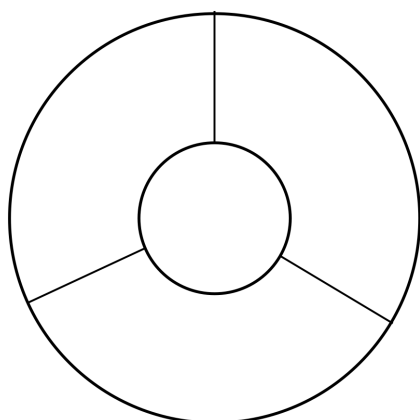


Preparation Task #2

Dartboard Results

Names: _____

Show the different dart boards you have designed where it is possible to score **9**, **14** and **21** with **3** darts.

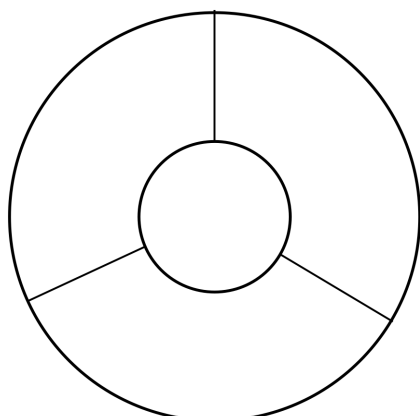


How to score **9**:

List all other possible scores:

How to score **14**:

How to score **21**:

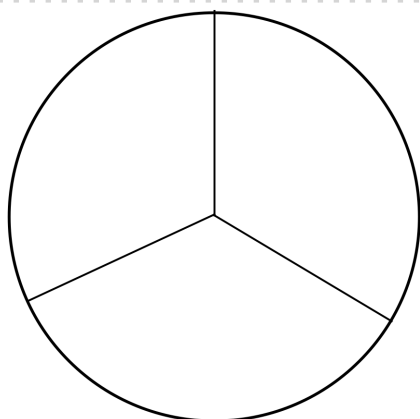


How to score **9**:

.....
List all other possible scores:

How to score **14**:

How to score **21**:

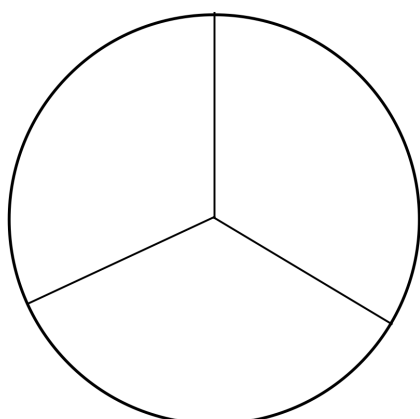


How to score **9**:

.....
List all other possible scores:

How to score **14**:

How to score **21**:



How to score **9**:

.....
List all other possible scores:

How to score **14**:

How to score **21**:



Preparation Task #3

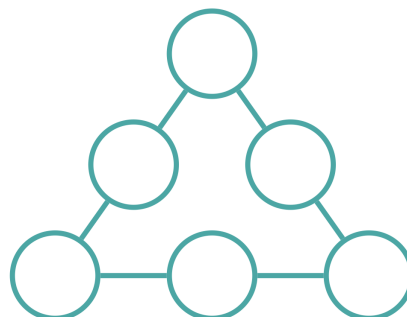
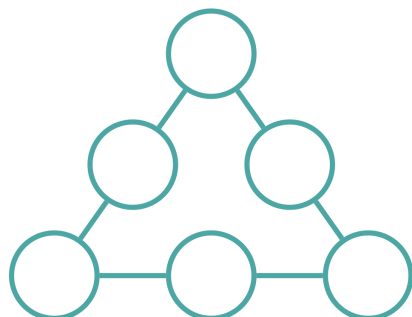
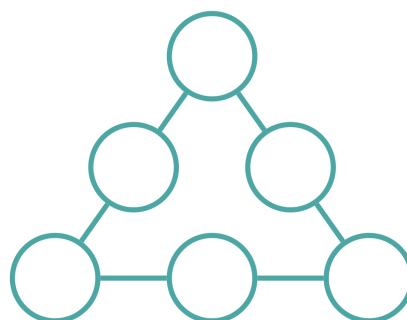
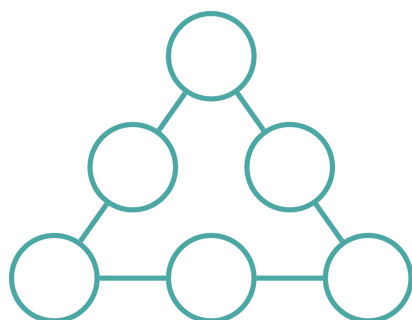
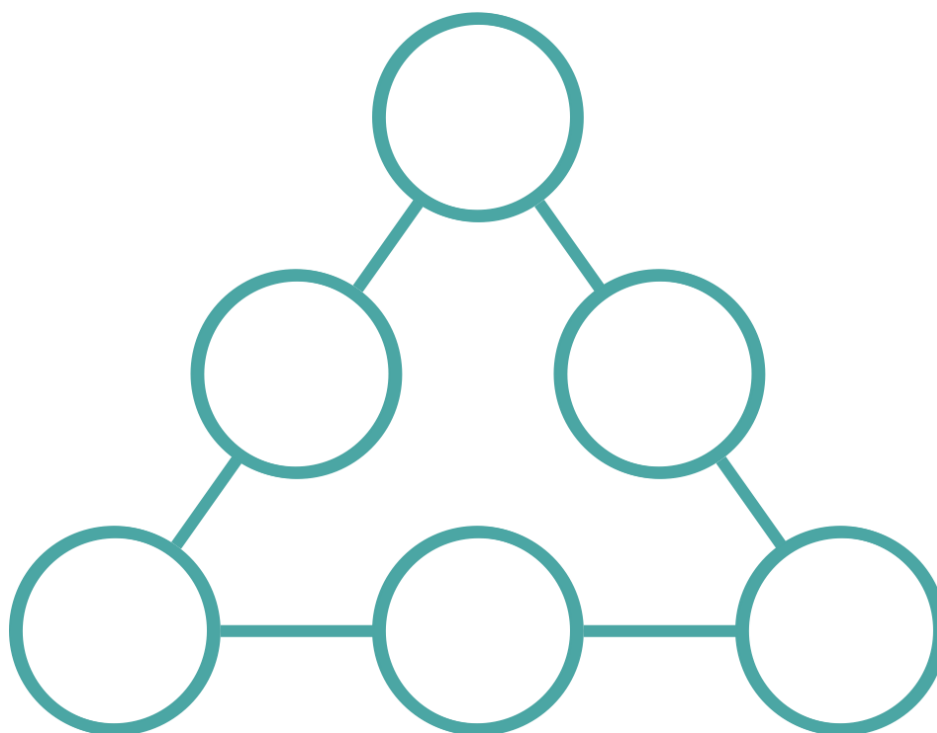
Triangle Challenges Explore

Names: _____

Explore ways to put the numbers 1 to 6 into this triangle so that each side adds up to **12**.

Cut out the numbers below and move them around to try out your ideas.

Record solutions that you find in the smaller triangles below.



1	2	3	4	5	6
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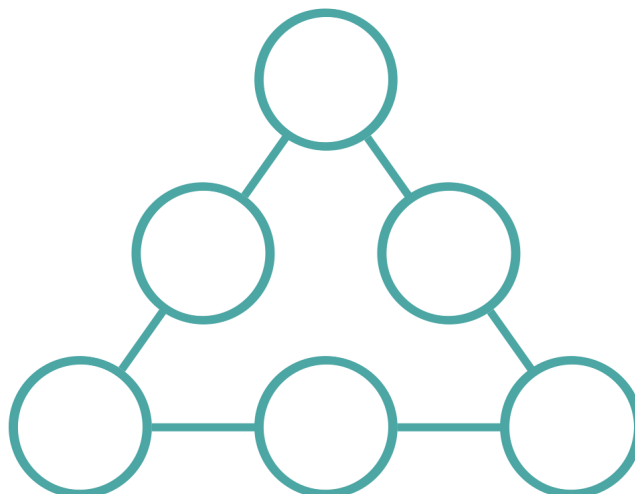
Preparation Task #3 Triangle Challenges Record

Names: _____

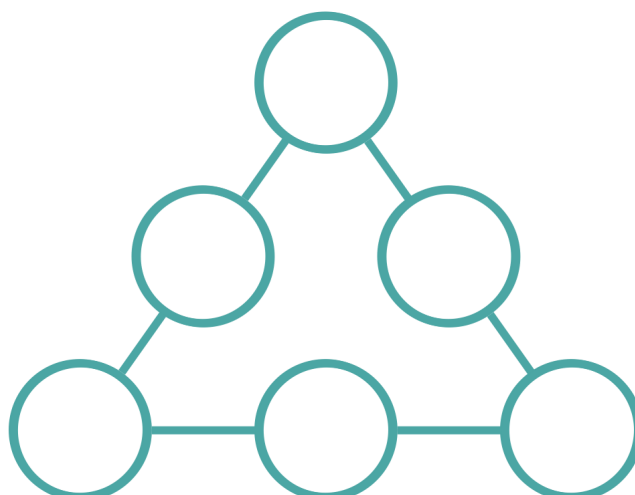
Keep using the triangle and the numbers 1 to 6.

Explore and **find** a way to place the numbers in the triangle so that the:

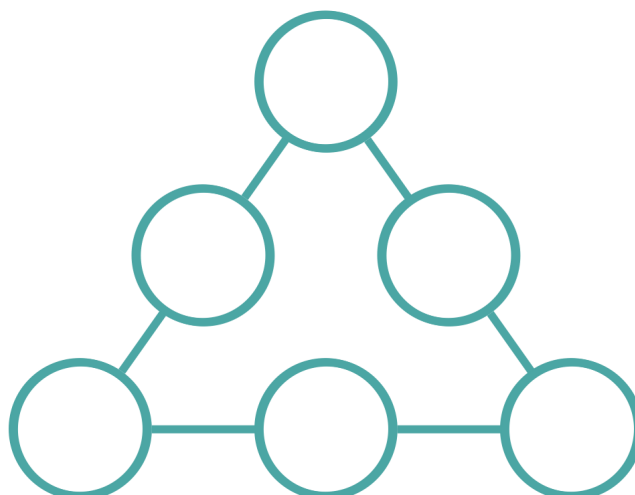
Sides add up to **9**



Sides add up to **10**



Sides add up to **11**

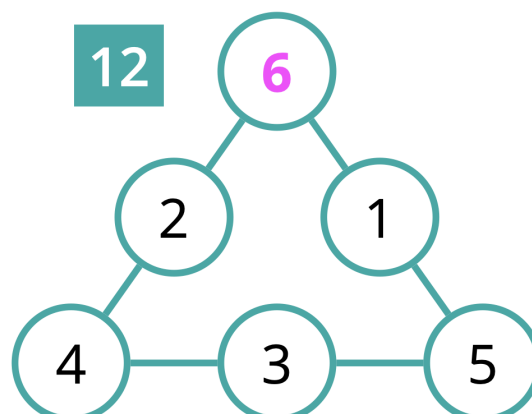
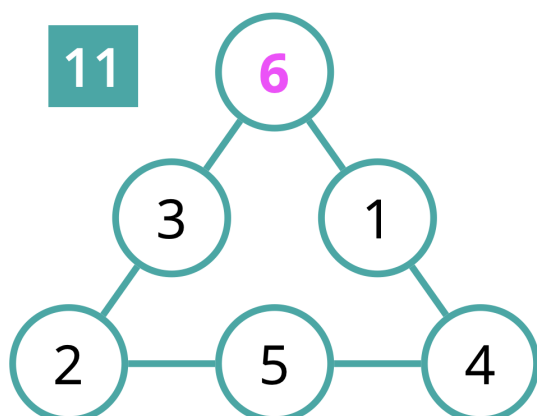
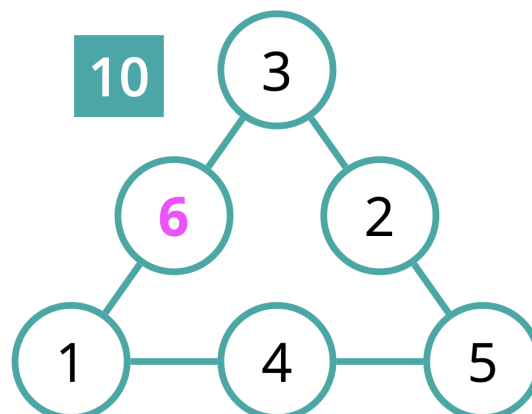
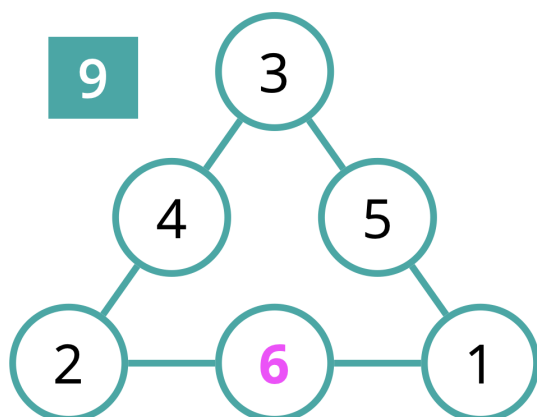




Names: _____

Preparation Task #4

Triangle Challenges Discuss and Explain



6 can't be placed in a corner when a triangle's sides add up to **9** or **10**.

6 can be placed in a corner when a triangle's sides add up to **11** or **12**.

Discuss and **explain** why it is impossible for 6 to be in a corner when the side total is 9 or 10.

Then, **discuss** and **explain** why it is possible for 6 to be in a corner when the side total is 11 or 12.

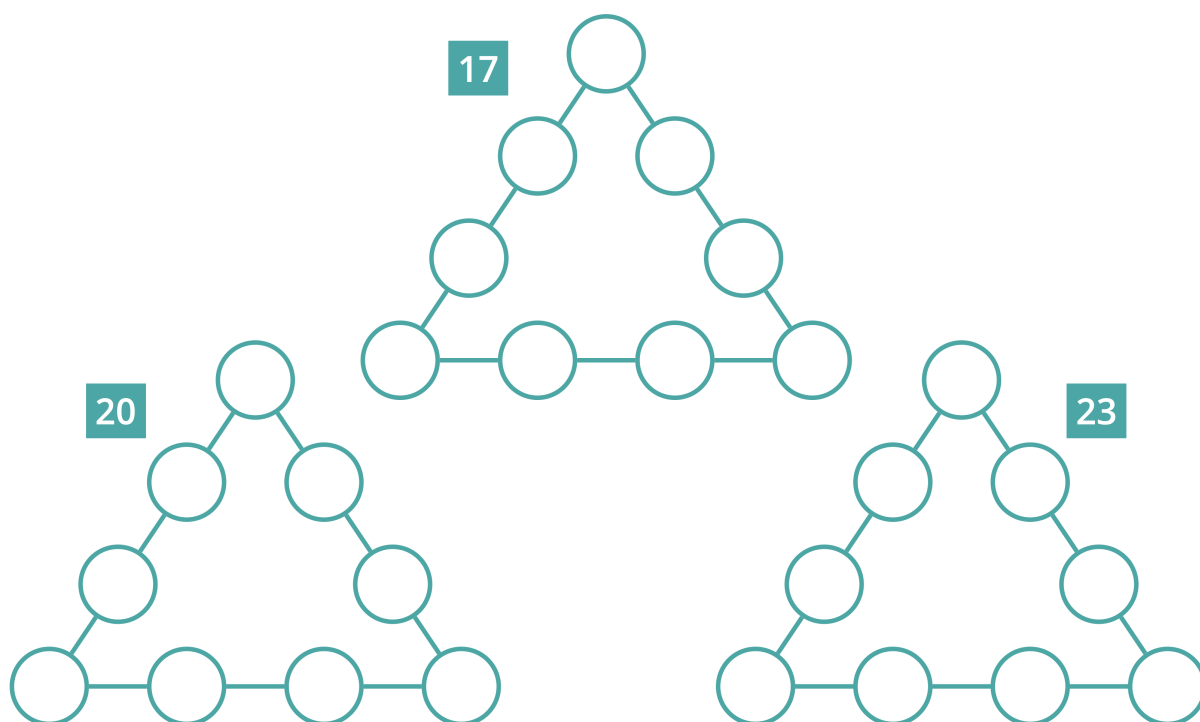
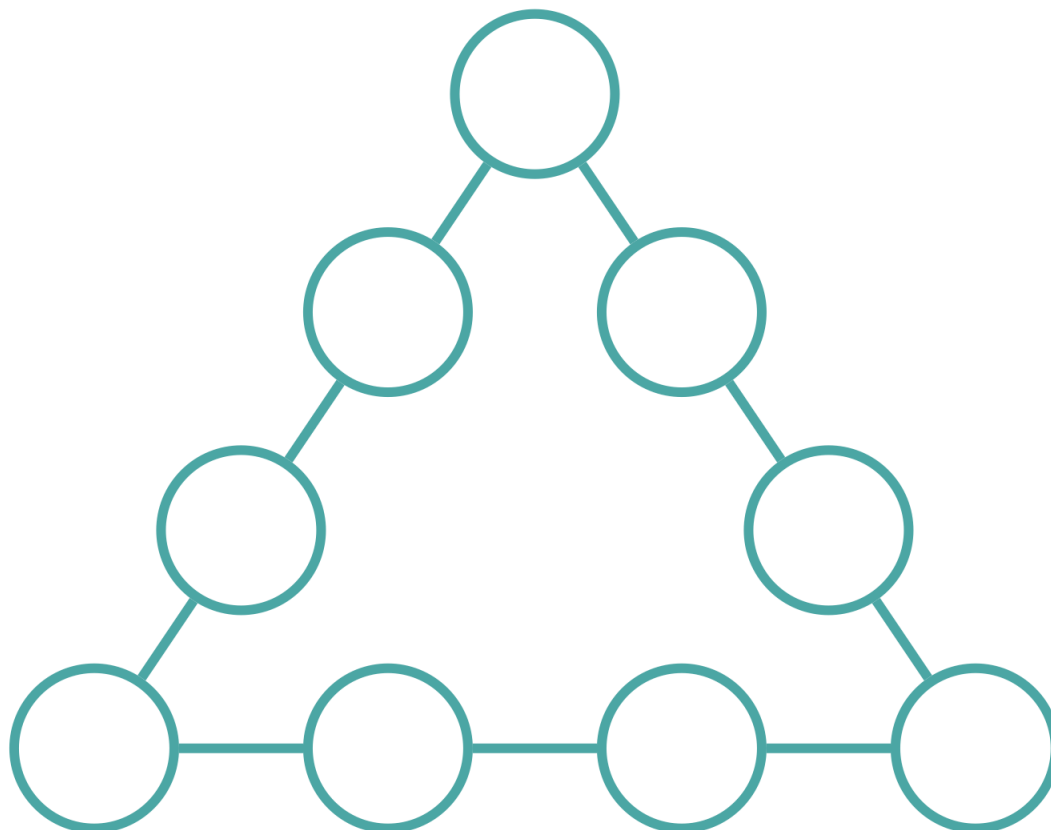


Preparation Task #4

Names: _____

Triangle Challenges Extension

Investigate placing the numbers 1 - 9 in this triangle so that the sides add up to **17**, **20** and **23**.



1	2	3	4	5	6	7	8	9
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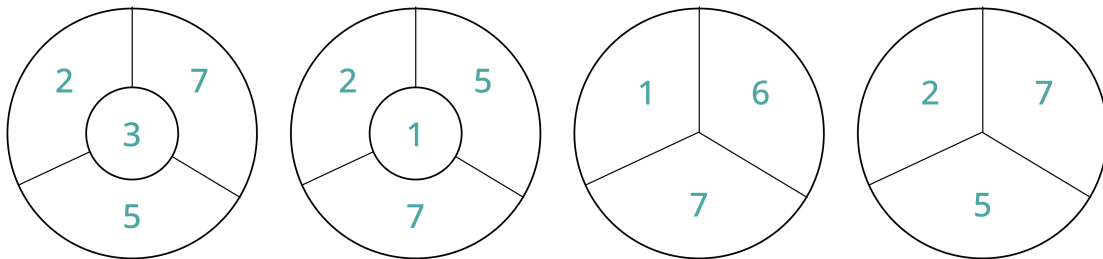
Preparation Task Solutions

Dartboard Challenges:

Preparation Task #1

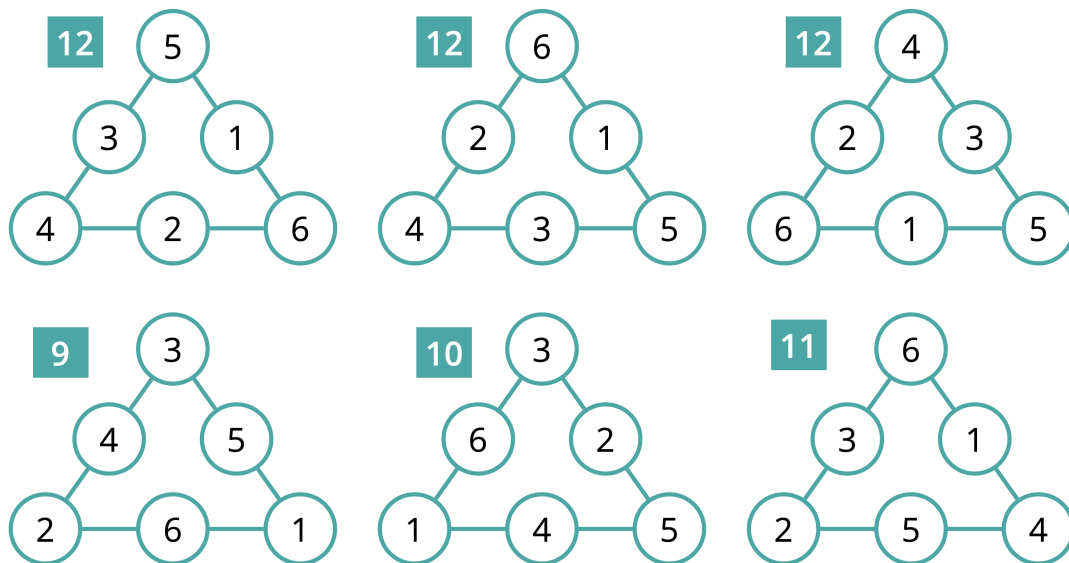
- Sung knew that 3 odd numbers must add up to an odd number. 14 is an impossible score.
- The other score in the list that is impossible is 23. The highest score with 3 darts is $7 + 7 + 7 = 21$.
- With 3 darts you can score 9, 11, 13, 15, 17, 19 and 21.
- Some examples of scores that you can get in more than one way include **15**: $3 + 5 + 7$ and $5 + 5 + 5$, **17**: $3 + 7 + 7$ and $5 + 5 + 7$. There are more.

Preparation Task #2



Preparation Task #3

There will be various rotations of these sides.



Preparation Task #4

There will be various rotations of these sides.

