

1, 2, 3 at Heide I can see. . .



NOTES FOR TEACHERS

Before your visit

Book your self-guided visit to Heide Museum of Modern Art

<http://www.heide.com.au/education/book-your-visit/>

Bookings for Education Week, May 18th – 22nd 2015 are free

Materials:

- Download and print the self-guided Maths Trail for your year level.
- Pencils and Clipboards

Method:

- Look at the mathematical vocabulary used in the trail – it may be necessary to review some of the terms (eg, geometrical shapes, solids, triangle, cylinder, square, rectangle, estimation, four operations, scale, common fractions, including $\frac{1}{2}$).
- Depending on your year level, students can work in teacher/parent led class teams, small groups or pairs.
- Establish how students are expected to record their responses.

Time:

- The self-guided Maths trail is designed to take 60 minutes to complete. Follow the directions that will lead you around the Sculpture Park to find the sculptures and answer the questions.

The Australian Curriculum

The activities in the trail have been designed to incorporate a number of content descriptions, including the following:

Foundation Year – Year 2

- ACMNA289 - Compare, order and make correspondences between collections, initially to 20, and explain reasoning.
- ACMNA015 - Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts.
- ACMNA031 - Recognise and represent multiplication as repeated addition, groups and arrays.

Years 3 – 4

- ACMNA060 - Describe, continue, and create number patterns resulting from performing addition or subtraction.
- ACMNA290 - Compare objects using familiar metric units of area and volume
- ACMNA087 - Compare the areas of regular and irregular shapes by informal means

Years 5 – 6

- ACMNA118 - Pose questions and collect categorical or numerical data by observation or survey.
- ACMNA115 - Apply the enlargement transformation to familiar two dimensional shapes. and explore the properties of the resulting image compared with the original.
- ACMNA136 - Convert between common metric units of length, mass and capacity.
- ACMNA128 - Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers.

1, 2, 3 at Heide I can see. . .

Foundation Year – Year 2



This Education Resource has been produced by Heide Museum of Modern Art to provide information and support educational institutions visits to the museum and as such is intended for this use only. Reproduction and communication is permitted for educational purposes only. No part of this education resource may be stored in a retrieval system, communicated or transmitted in any form or by any means.

Outside the main entrance turn right. On the grassy hill find a sculpture called Rings of Saturn. What year was it made?



Year ____ / ____

How many intersecting rings can you find? _____

How many times do the rings touch each other? _____

Walk around the sculpture. With the sculpture in front of you look at the window in main building. Position yourself so you see the reflection of the sculpture in the window?

Can you explain why it appears a different size in the reflection?

The rings are at different angles. Draw 2 of the rings that you see?

On the way back to the main entrance, find this sculpture by Emily Floyd.
What year was it made?



Year _____

What is the tallest shape you can see? _____

How many sides does it have? _____ How many are there? _____

What is the smallest shape you can see? _____

How many sides does it have? _____ How many are there? _____

How many semi circles can you find? What colour are the semi circles?

How many triangles can you find? How many are pointing down?

Draw and label five shapes you can see.

--	--	--	--	--

The shapes are making up letters. Can you find a letter that is in your name? Draw your name using shapes for letters.



Walk past the café to the end of Heide II. Keep going till you get to a group of three figures called Stages I, II and III. What year was it made?



Year _ _ _ _

Find the smallest form. Guess how many of your feet it would take to measure the distance to the tallest form?

Take five steps, make sure you line up your feet so there are no gaps. Guess the distance from the smallest to the tallest form again.

Now measure using your feet. Walk from the smallest to the tallest form. How many of your feet did it take?

Share the results with your group. Did you have the same number as your teacher. Why/why not?

Further down the hill to the right corner of the garden is a figure on a base of rocks called Aeroplane boy. What year was it made?



Year _ _ _ _

Stretch out your arms like Aeroplane Boy. Compare your arm span to Aeroplane Boy's. _____

How many times does your arm span fit into Aeroplane Boy's? _____

How many people from your group standing with their arms extended does it take to be nearly the same as Aeroplane Boy's?

Estimate how many times longer are Aeroplane Boy's arms than his legs?

How much bigger is his head than his body? _____

Count how many stones make up the hill he is standing on? _____

Keep walking to the middle of the open field. What animals do you see?
What year where they made?



Year _ _ _ _

Count how many there are?

How many legs does each cow have?

How many legs do the cows have altogether?

How many ears do the cows have altogether?

Walk back towards the house, on the far right hand side of the pergola. Keep walking towards the long hedge. In the distance you will see a big rusty geometric shape. What year was it made?



Year _ _ _ _

What is the shape? _____ How many sides does it have? _____

Does it look solid or empty? _____

Walk up close to it and stand next to the shape.

Name the small shape that is repeated to make this structure?

How many of these shapes equal the height of your body?

How many shapes high is the sculpture?

How many shapes long is it?

Look through the sculpture in different directions. (Up, down, left and right). As your viewpoint changes what do you notice about the lines and shapes?

Draw 4 of the interesting shapes you can see. One with 3 sides, 4 sides, 5 sides and 6 sides.

Walk to the near end of the hedge. Around the corner is a pathway.
What year was it made?



Year _ _ _ _

What is the shape that forms the pattern?

What is happening to the shape to make this pattern?

Estimate how many times the pattern is repeated in the path?

Estimate how many bricks are used in this path?

Draw the pattern that makes up the path.

From the start of the pathway. Look over to your right. Can you see the stacks of boxes? What year was it made?



Year _ _ _ _

How many boxes are in the higher stack? _____

How many boxes are in the shorter stack? _____

How many boxes altogether? _____

Measuring with your feet. How long is the connecting pipe?

Being careful not to touch the sculpture. Measure with your hands how many hands high is the shortest stack? _____

Estimate how many hands high the taller stack is? _____

What kind of thing might fit inside these boxes? _____

Would you be able to carry a box full of those things? _____

Follow the path to the blue sculpture called Basket and Weave. What year was it made in?



Year _ _ _ _

The blue basket is leaning on a shape. Can you name the shape?

One side of the shape has steps. How many steps does it have?

The long curved panel creates the wave shape. It is divided into rows. How many rows are in the wave panel?

How many times do you think the basket would fit in to the wave?

Walk back up hill on the path. Turn right at Stages I, II and III and walk back past the café to the main entrance.

Finally, add up all the years that the sculptures were made.

1, 2, 3 at Heide I can see. . .

Year levels 3 and 4



This Education Resource has been produced by Heide Museum of Modern Art to provide information and support educational institutions visits to the museum and as such is intended for this use only. Reproduction and communication is permitted for educational purposes only. No part of this education resource may be stored in a retrieval system, communicated or transmitted in any form or by any means.

Outside the main entrance turn right. On the grassy hill find a sculpture called Rings of Saturn. What year was it made?



How many rings can you find?

How many times do the rings touch each other?

Angles are created where the rings touch. How many angles do you see?

How many angles are less than a right angle? How many angles are more than right angle? Can you see any right angles?

Look up the hill to the end of the carpark. There are some similar white 3D shapes? What are they called? How many different sizes can you see?

Walk around the sculpture. With the sculpture in front of you look at the window in main building. Position yourself so you see the reflection of the sculpture in the window?

Can you explain why it appears a different size in the reflection?

Draw each ring or part of a ring that is in the sculpture.

Can you make up a fraction that could describe the elements of this sculpture? _____

On the way back to the main entrance, find this sculpture by Emily Floyd.
What year was it made?



List all the geometrical shapes you can see?

How many triangles can you find? What type of triangles are they?

How many shapes in this sculpture altogether?

What do you think the shapes are making?

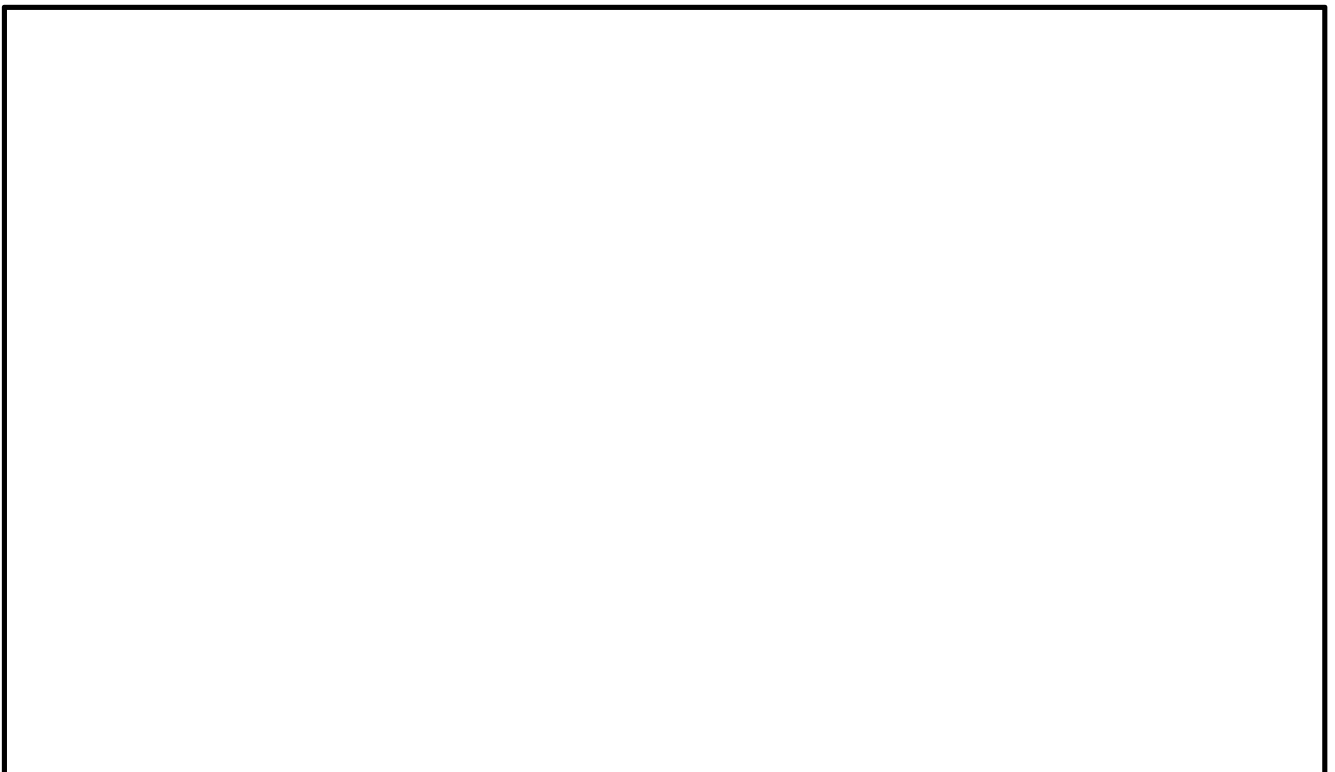
What shapes are making the letter b?

Walk around the back of the sculpture. Choose a shape or letter. How many shelves does it have?

Estimate how many shelves are in the whole sculpture.

Count how many shelves in each shape. Add them together for total amount of shelves. How close was the answer to your estimation?

Draw your name using the shapes in the sculpture to make the letters.



Walk past the café to the end of Heide II. Keep going till you get to a group of three forms called Stages I, II and III. What year was it made?



Stand near the shortest form. How high is it compared to your height?

Estimate how high it is using your hand as a unit of measurement.

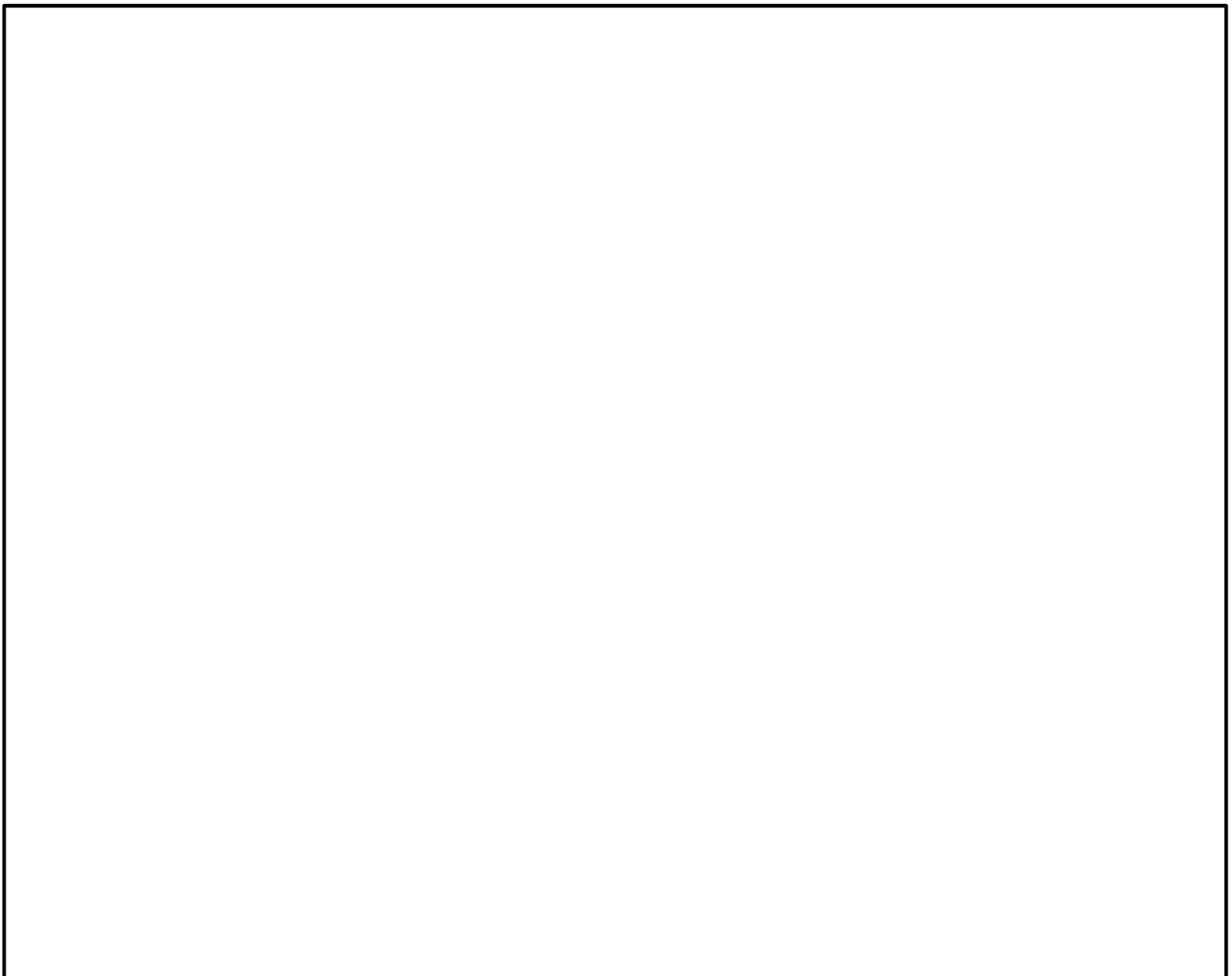
Now measure it using your hands. **Be careful not to touch the artwork.** How many hands high is the smallest form? Was the answer different to what your estimation?

Share the results with the rest of your group. Did you have the same number as your teacher. Why/why not?

How would you describe these shapes? Regular, Irregular, geometric, organic?

Choose one form. The form is made up of several regular shapes. Talk about the regular shapes and parts of regular shapes that the artist might have used like building blocks to make the form.

Draw the form. Show the regular shapes that make up the form.



Follow the path down the hill with the fenced kitchen garden on your right. Cross a bridge and continue till you find the paved pathway.



What shape is being repeated? How many shapes make up the basic pattern? What is happening to the shapes to make this pattern?

Estimate how many times the pattern is repeated in the path?

Based on your estimation how many bricks are used in the whole path?

How did you work it out? _____

Using this shape draw a different tessellating pattern.



Follow the path to the blue sculpture called **Basket and Weave**. What year was it made in?



Can you see the solid shape under the blue basket? Name the shape?

What do you think the purpose of this shape is?

Which do you think is heavier? The sculpture or the platform it's on.

The long curved panel creates the wave shape. It is divided into rows. How many rows are in the wave shape?

Each row has sections. Write a fraction for one of the rows?

How many times do you think the basket would fit in to the wave?

How many circles make up the basket shape? _____

What would you call this 3D shape? _____

Would you use millilitres or litres to measure it's volume? _____

From the start of the pathway. Look over to your right. Can you see the stacks of boxes? What year was it made in?



How many boxes are in the taller stack? _____

How many boxes are in the shorter stack? _____

How many times higher is the taller stack? _____

Measuring with your feet. How long is the connecting pipe?

Being careful not to touch the sculpture. Measure with your hands how many hands high is the shortest stack? _____

Estimate how many hands high the taller stack is? _____

What kind of thing might fit inside these boxes? _____

Can you draw a net for one of the boxes?

Walk back towards the house, on the far right hand side of the pergola. Keep walking towards the long hedge. In the distance you will see a big rusty geometric shape. What year was it made?



What is the shape? _____ Does it look solid or empty? _____

Walk up close to it and stand next to the shape. Name the small shape that is repeated to make this structure? _____

How many of these shapes high is the structure? _____

How many shapes long is it? _____

Complete a multiplication sentence that describes this array?

That number sentence is also calculating the _____ of the shape.

Walk around the sculpture. Using the little shape as a unit of measurement, can you work out the structure's perimeter?

Look through the sculpture in different directions. (Up, down, left and right). As your viewpoint changes what do you notice about the lines and shapes?

Draw 4 of the different shapes that you can see when you look through this sculpture. They can be 2D or 3D.

Walk back up to the left side of the kitchen garden. Find the pergola with a roof that looks like wings.



Walk around the pergola and look for lines of symmetry. Does the pergola have symmetry?



Walk back up the hill. You will come to a playful figure on a base of rocks.



Over this picture draw in the line of symmetry.

Finally, add up all the years that the sculptures were made.

1,2,3 at Heide I can see. . .

Year levels 5 and 6



This Education Resource has been produced by Heide Museum of Modern Art to provide information and support educational institutions visits to the museum and as such is intended for this use only. Reproduction and communication is permitted for educational purposes only. No part of this education resource may be stored in a retrieval system, communicated or transmitted in any form or by any means.

NOTES FOR TEACHERS

Before your visit

Book your self-guided visit to Heide Museum of Modern Art

<http://www.heide.com.au/education/book-your-visit/>

Bookings for Education Week, May 18th – 22nd 2015 are free

Materials:

- Download and print the self-guided Maths Trail for your year level.
- Pencils and Clipboards

Method:

- Look at the mathematical vocabulary used in the trail – it may be necessary to review some of the terms (eg, geometrical shapes, solids, triangle, cylinder, square, rectangle, estimation, four operations, scale, common fractions, including $\frac{1}{2}$).
- Depending on your year level, students can work in teacher/parent led class teams, small groups or pairs.
- Establish how students are expected to record their responses.

Time:

- The self-guided Maths trail is designed to take 60 minutes to complete. Follow the directions that will lead you around the Sculpture Park to find the sculptures and answer the questions.

The Australian Curriculum

The activities in the trail have been designed to incorporate a number of content descriptions, including the following:

Foundation Year – Year 2

- ACMNA289 - Compare, order and make correspondences between collections, initially to 20, and explain reasoning.
- ACMNA015 - Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts.
- ACMNA031 - Recognise and represent multiplication as repeated addition, groups and arrays.

Years 3 – 4

- ACMNA060 - Describe, continue, and create number patterns resulting from performing addition or subtraction.
- ACMNA290 - Compare objects using familiar metric units of area and volume
- ACMNA087 - Compare the areas of regular and irregular shapes by informal means

Years 5 – 6

- ACMNA118 - Pose questions and collect categorical or numerical data by observation or survey.
- ACMNA115 - Apply the enlargement transformation to familiar two dimensional shapes. and explore the properties of the resulting image compared with the original.
- ACMNA136 - Convert between common metric units of length, mass and capacity.
- ACMNA128 - Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers.

Outside the main entrance turn right. On the grassy hill find a sculpture called Rings of Saturn. What year was it made?



This sculpture is made up of open and closed shapes. How many open shapes? _____ How many closed shapes? _____

What are the open shapes called? _____

Are they minor or major? _____

Where the rings intersect, angles are formed. How many angles do you see? _____

List the type of angles formed in relation to a right angle.

Estimate the diameter of the largest circle in metres.

How did you work it out?

Convert your answer to centrimetres.

Approximately what is the height of the structure?

Walk around the sculpture. With the sculpture in front of you look at the window in main building. Position yourself so you see the image of the sculpture in the window?

Describe 2 ways that the image has been transformed?

Is the transformation and the original shape congruent or simillar?

Walk back to the main entrance and continue on past the café to the end of Heide II. Turn left and walk down the path past the kitchen garden. On your left you will see a sculpture called Basket and Wave. What year was it made?



What shape is the pedestal that the sculpture is on?

About how tall is the pedestal? Can you estimate the height of the whole sculpture?

Estimate the internal angles of the pedestal.

In relation to the flat ground can you estimate at what angle the basket is leaning?

How many concentric circles can you count?

About how many centimetres apart are the concentric circles?

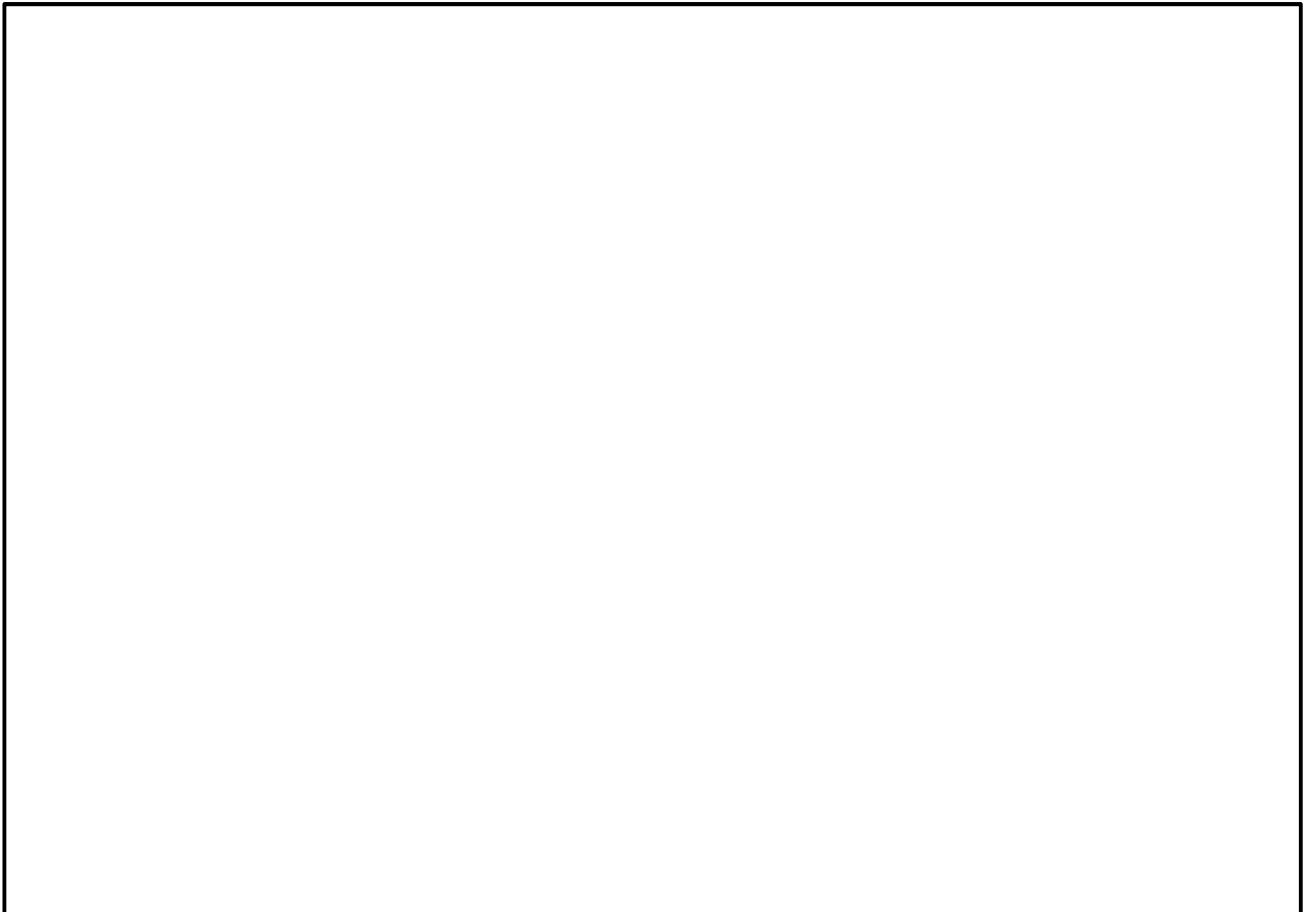
From these estimations can you estimate the volume of the basket shape?

The long curved panel creates a wave shape. It is divided into rows. How many rows are in the wave shape?

Each row is segmented. Write a fraction for one of the rows?

Convert your answer to a decimal and a percentage.

Draw a translation and rotation of the shape of Basket and Wave.



Go back to the (STEIN) path, continue to the end of the long hedge. Turn right. This sculpture is called Theoretical Matter. What year was it made?



From a distance what is shape?

Up close what shape is it? Draw and label.

Can you identify some of the features of this 3D object?

Name the small repeating shape that makes up the grid of the structure.

Use this small shape as a unit of measurement. The repetition of the shape creates an array.

Estimate the length and height of the small shape in centimetres.

Calculate the height and length of the structure in metres.

Explain how you found your answer.

Calculate the area of the different faces of the prism.

Explain how you found the answer.

Calculate the perimeter of the sculpture.

Explain how you found the answer.

Walk back to where you were at the end of the hedge. With Theoretical Matter on your right hand side walk through the park across to this pavilion. What year was it made?



Draw a Floor Plan of this structure on the back of this sheet.

Estimate how many people could sit down on the floor in this space.

Explain how you got your answer.

Finally, which of these 4 sculptures was made most recently?
