Kirigami Resource

This resource was developed as part of a Graphics webinar which aired on the 16th of October 2019 and can be viewed on jct.ie within the CPD supports tile under the elective workshops tab.

Webinar Link:
https://www.jct.ie/technologies/cpd_supports_graphics_elective_workshops

This webinar entitled *"Engaging with the Graphics Specification"* focused on how a teacher developed a unit of learning with a focus on classroom practice and the learner experience. In the first part of the webinar the unit of learning was discussed by the JCt4 Graphics team initially exploring how the teacher choose the learning outcomes and then outlining the key learning as identified by the teacher. The second part of the webinar the team were joined by the teacher who developed this unit of learning and he discussed how his students experienced the learning in his classroom.

What is included in this PDF?

1. Sample unit of learning
2. Kirigami worksheets

1. Sample unit of learning

Included is the sample unit of learning developed by the teacher. Highlighted in the plan is what learning outcomes are being activated by the worksheets. A red box will highlight the learning outcomes, key learning, evidence of learning and the learner experience sections within the plan to emphasise where the resource fits within the context of the unit.
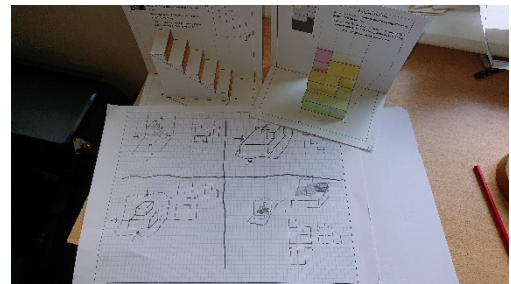
2. Kirigmai worksheets

As part of the unit of learning the teacher developed handouts to activate the learning outcomes within the unit. These handouts were intended for a specific class group and was designed within the context of their learning journey. It is recommended that this resource be tailored to suit your own specific class group and context.

A big thank you to the teacher involved for making these resources available to the JCt4 team.

Note: It is recommended that you watch the webinar in conjunction with using these resources to contextualise the resource and make a better connection between resource and learning outcomes.

Teacher Name: **Sample Example**

GRAPHICS PLANNER

Class Group: **1st Year X**

Unit: **Geometric Constructions 2 and 3D representations**

Duration: 3/4 Weeks

Date Commence:

Consider the age, stage and prior learning of the students.

What learning do we want to focus on?

Explore both the strands and elements when choosing learning outcomes.

Identify the learning outcomes for your unit of learning.

Identify the key learning for students using action verbs to support your thinking.

Consider how we will assess and report evidence of learning

Develop ideas for how students could experience this learning.

How will I know they are learning?

Using your own classroom context, what methodologies and resources will support students in experiencing the learning outcomes.

Ensure assessment aligns with the learning outcomes and their action verbs

AGE AND STAGE:

1st year students, Term 1

PRIOR LEARNING:

Geometric constructions of bisectors, use of drawing equipment. Cutting matt and knife.

FOCUS OF LEARNING:

Geometric constructions continued and 3D graphics strand

EXPLORE STRANDS AND ELEMENTS:

~~1.2~~, 1.6, 1.12, 2.3, 2.8, ~~2.13~~, 3.1, ~~3.9~~

CHOSEN LEARNING OUTCOMES

1.6 apply their understanding of geometric principles to solve problems

1.12 construct 2D solutions accurately in accordance with graphical conventions

2.3 derive 3D solutions using appropriate media

2.8 construct a 3D representation of an artefact or abstract idea using a variety of media and methods

3.1 recognise 2D and 3D features in everyday objects and artefacts

KEY LEARNING

1.12 – Division of a line.

3.1 – Identification of geometric concepts in the real-world including bisectors and divisions.

1.6, 1.12 – Application of bisectors and divisions of line to solve problems.

2.3 – Create a 3D model using the Paper.

2.8 – Sketch models in 2D and 3D.

ACTION VERBS

Apply: select and use information and/or knowledge and understanding to explain a given situation or real circumstances

Construct: develop information in a diagrammatic or logical form; not by factual recall but by analogy or by using and putting together information

Derive: to be formulate or prepare from concepts

Recognise: identify facts, characteristics or concepts that are critical (relevant/ appropriate) to the understanding of a situation, event, process or phenomenon

HOW COULD STUDENTS EXPERIENCE THIS LEARNING?

Using drawing equipment, model-making, researching, sketching, mood boards and problem-solving.

ONGOING ASSESSMENT

3.1 – Researching – Taking photos (primary) and researching online(secondary) real-world examples of bisectors and divisions.

1.6 – Solving posed questions using geometric constructions.

1.12, 2.3 – Applying the division of the line construction to aid in the creation of models.

2.8 – Creating sketches of models in 3D and the faces of models.

Teacher observation and feedback

RESOURCES

Standard drawing equipment, Padlet, cutting mat, knife, steel rule, heavy A4 paper (100gsm or higher), visualiser, worksheets.

METHODOLOGIES

Teacher discussion, teacher demonstration, Researching (Primary, Secondary) taking photos, drawing, model-making, creating sketches.

### HOW WILL STUDENTS EXPERIENCE THE LEARNING OUTCOMES?

3.1 – Collaborating on Padlet. Taking photos of geometric concepts and researching online for suitable examples.

1.12 – Teacher discussion and demonstration on division of the line.

1.6 – Applying their knowledge of geometric constructions to solve posed questions.

2.3, 2.8 – Model making using the division of a line construction.

2.8 – Sketch a 3D representation of the models. Sketch 2D representation of model (Use grid paper to differentiate)
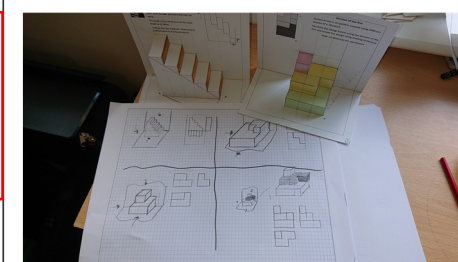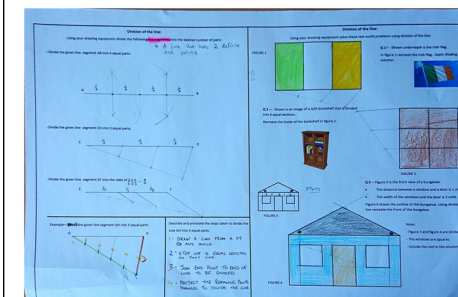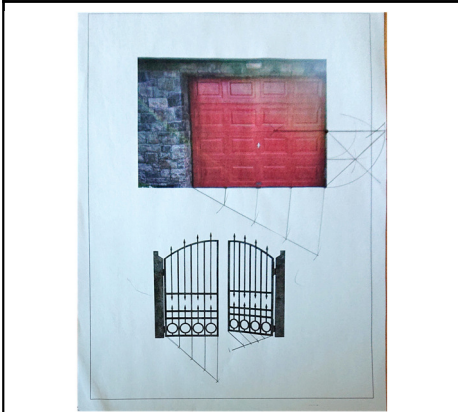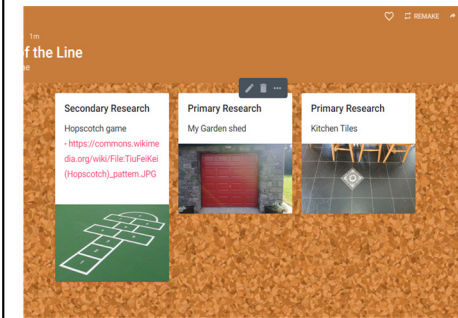
REFLECTION

During and having completed the unit of learning, you may wish to consider questions such as;
- Did the selected learning outcomes integrate well together?
- What learning experiences did I create with my students?
- Would I change any of the agreed assessment checks?
- How might we return to these learning outcomes in a future unit of learning?

Division of a line

Shown in **Fig.1** is the outline of a set of stairs. The *rise* of each step is equal. The *run* of each step is equal.

The overall length of line AB (overall run) is not the same length as AC (overall rise)

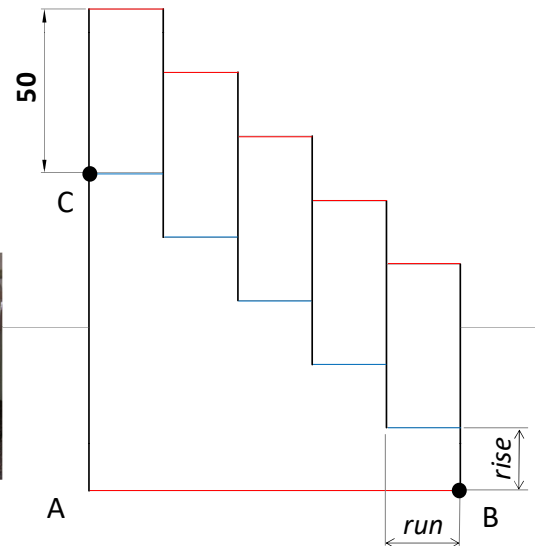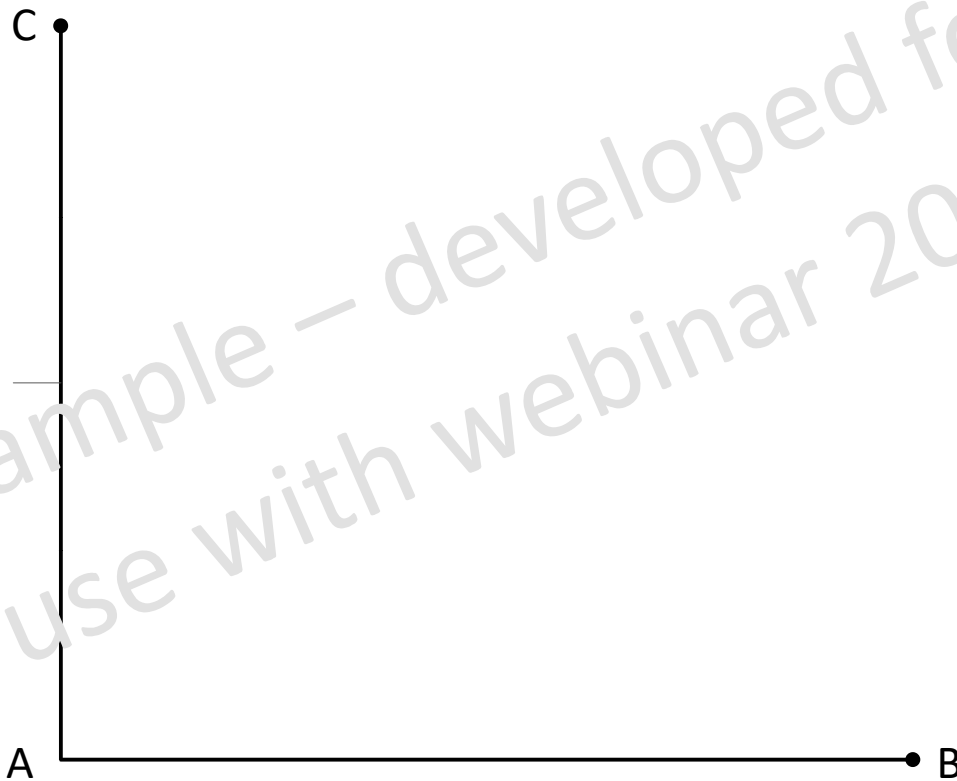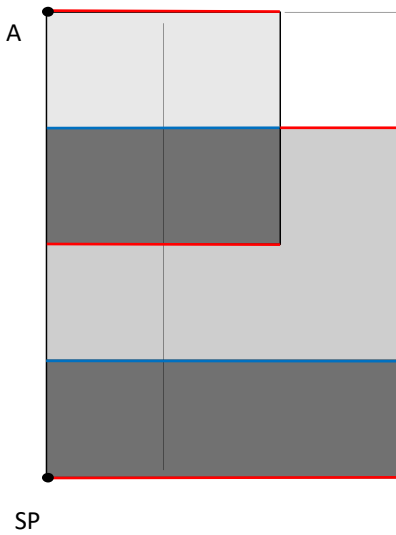Construct the stairs below, using the lines AB and AC as a guide

50

C

rise

run

A

B

Fig.1

C •

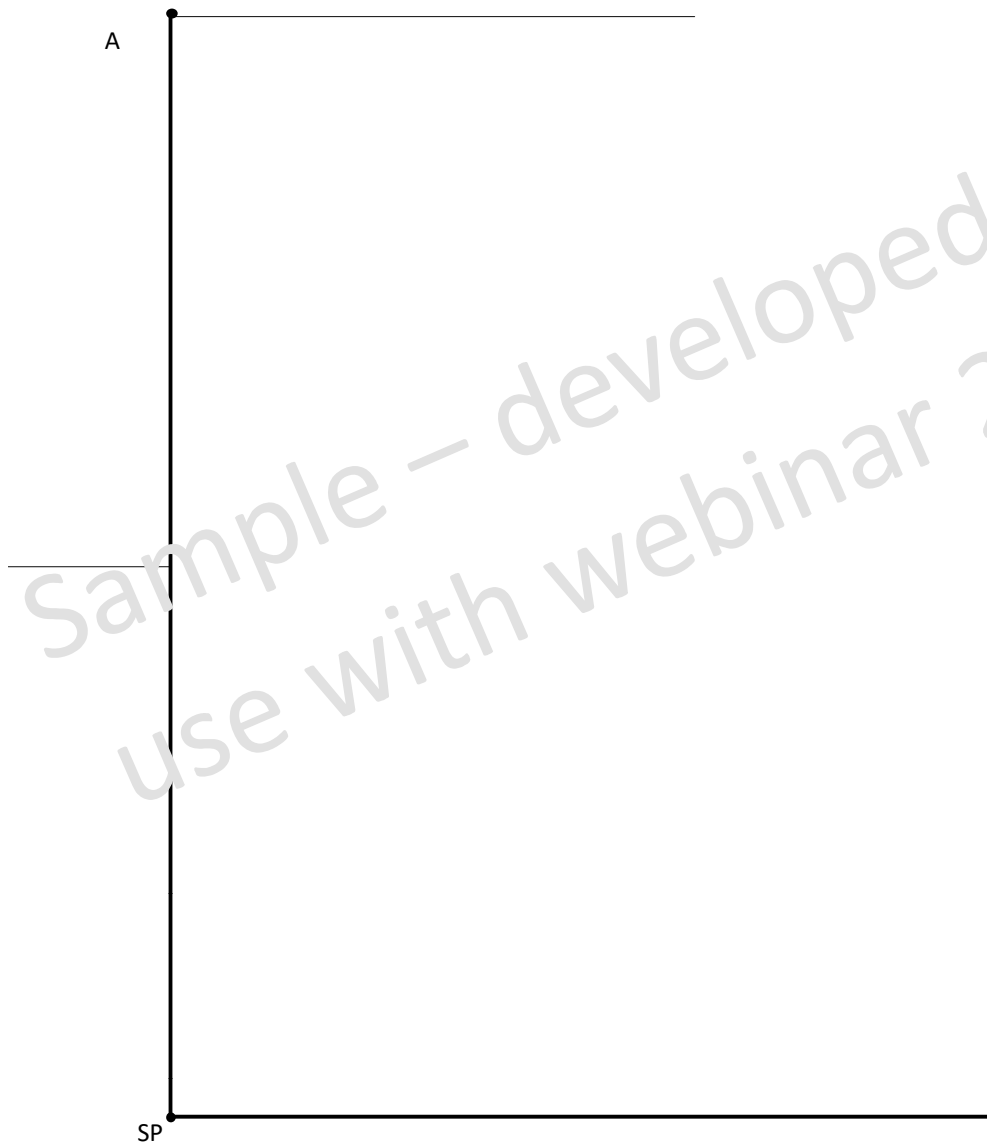A •————————————————————• B

A

SP

Division of a line

Shown across is a grey pattern, created using different shades of a pencil.

Accurately recreate the design below, creating the design using a shading technique of your choice.
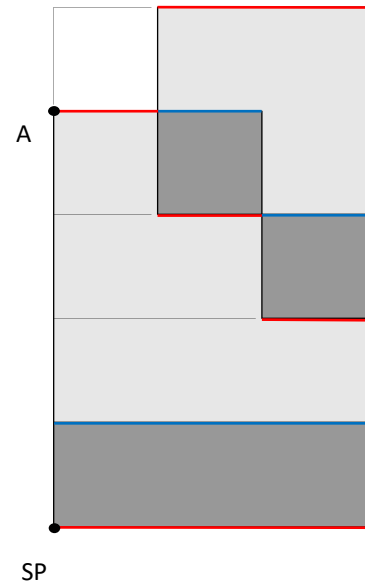
Note: All distances are equidistant

A

SP

*SP indicates a suitable **Starting Point***

Division of a line

Shown across is a grey pattern, created using different shades of a pencil.

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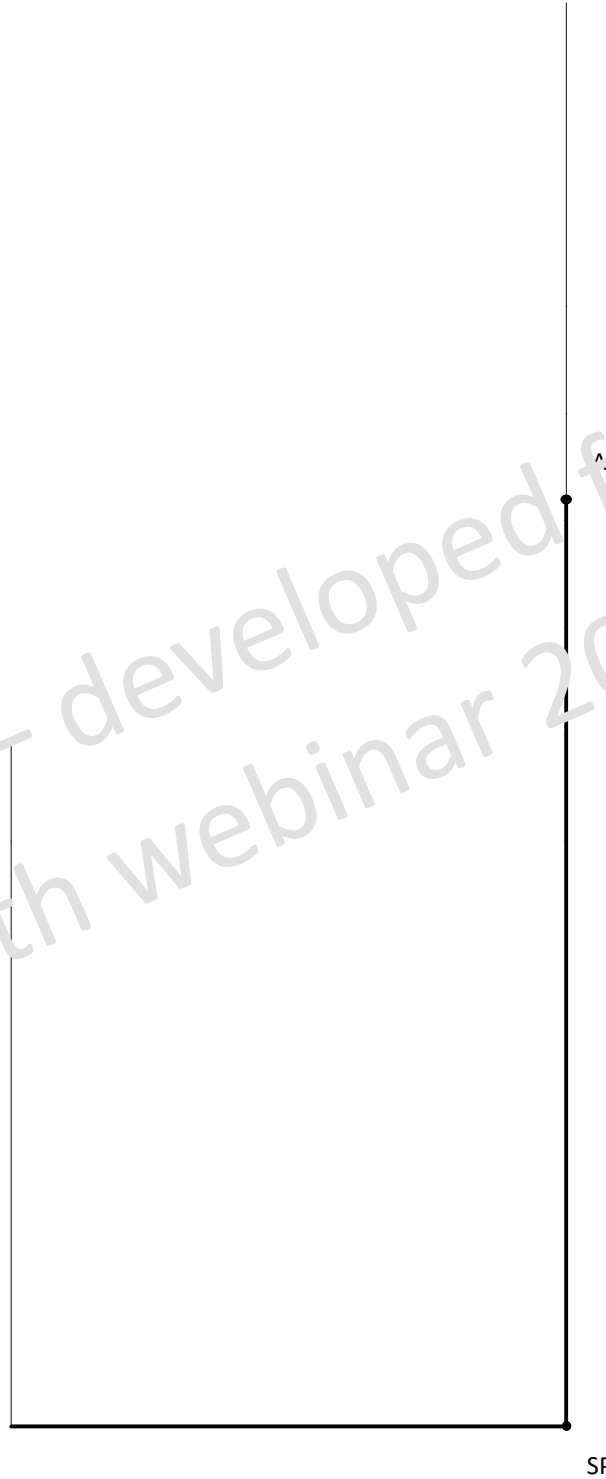*Note: All distances are equidistant*

A

SP

A

SP

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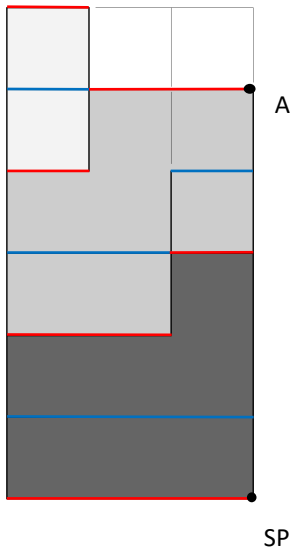*Note: All distances are equidistant*

A

SP

SP

HOW TO CREATE KIRAGAMI MODELS

Cut all vertical lines

Horizon Line

Fold Lines (Red & blue)

Steps:

1. Complete the drawing.

2. Using a cutting matt, knife and steel ruler, cut all the vertical lines (black lines).

3. Extend out the horizon line to both sides of the page and fold along this line.

4. Fold the red lines (valley folds) and pinch the blue lines (mountain folds).

5. The red and blue lines fold in opposite ways (internal & external).

Tip:

For best results print outlines on heavy paper (suggested — 100g-sm or above)