OVER THE CANAL

Students use visual thinking strategies to develop their observational skills

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STAMPEd

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SUITABLE FOR AGE(S)	SUBJECT(S)	KEY FOCUS
6-17 years	Mathematics, Science, Interdisciplinary studies	Observation skills Scientific reasoning

INTRODUCTION

This rich task invites students to analyse photographs using Visual Thinking Strategies (VTS) to develop their observational skills, scientific language, and reasoning from evidence. VTS is a method for deepening engagement with visual media through structured inquiry. Students are guided by three key questions:

1. What do you think is going on in this picture?
2. What do you see that makes you say that?
3. What more can we find?

The task encourages observation, hypothesis testing, and creative science thinking to foster evidence-based reasoning, dialogue, and collaborative meaning-making. It is suitable for learners aged 6–17, and is adaptable to both face-to-face and remote learning environments. Teachers can integrate the task with various curriculum topics in science, mathematics, ethics, and interdisciplinary studies.

TASK DESCRIPTION

Students observe and describe an image, form hypotheses, compare them with memory, and take photos based on scientific patterns or seasonal features. The task unfolds in three parts, allowing progression from guided interpretation to student-created content.

In the first part of the task, students working in groups are encouraged to identify patterns and use scientific language in their description of the picture. Subsequently, students formulate hypotheses about the situation in the picture and attempt to find evidence to support or refute their assumptions. Students are given the following prompts - •What do you think is going on? •What do you see that makes you say that? •What more can we find?

In the second part of the task, students are asked to compare situations in two pictures when seeing only one of them and recalling the other, thereby further practising their observational skills.

In the third part of the task, students are asked to take a meaningful picture related to a topic of their choice. The main purpose can be outlined by the teacher (e.g., take a picture of geometrical patterns, a physics phenomenon which you can explain later, or anything evidencing the current season, etc.)

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TASK PREPARATION

The teacher needs to prepare a picture that serves the purpose of the task. For the second part of the task, a set of two slightly different pictures will be required. The teacher projects the picture(s) to the whole class, so the pictures must be of good quality. For the third part of the task, each student will need a camera, such as a smartphone.

Group work: Students work interchangeably – individually and in groups of three or four, comparing their individual observations.

Place: The first two parts of the task take place in the classroom. The third part can be organised as homework or during a school trip. The task can also be implemented during remote classes by utilising breakout rooms.

Materials Needed

- Printed pictures or projected images
- Smartphone or camera
- Notebook or digital journal/note-taking tool
- Optional: seasonal props or example photos

TASK IMPLEMENTATION

The task is conducted in three parts, allowing a progression from guided observation and interpretation to student-generated content.

Activity part 1 [Guided Observation]

Depending on the purpose of the activity, on the picture(s) selected by the teacher, and on the student's familiarity with the situation in the picture, this part can be organized as an introduction by the teacher or as a brainstorming in which students (without seeing the picture yet) are building together a storyline based on their context, prior experience, and knowledge.

The teacher introduces a picture (Figure 1) by providing a brief historical context for the image (see Appendix for image background).

Students are asked to describe the scene in the photograph while considering how science or mathematics might be connected or present. In their description, they should incorporate as many scientific, mathematical, or numerical terms as possible. They can draw from their imagination or real-life experiences for this task. The activity is conducted in groups of three to four students. Each member takes a specific role: Chairperson/Timekeeper/Reporter/Recorder/Scribe, or Graphic Designer.

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Figure 1. Photograph 1 of the Royal Canal at the entrance to Carton Estate in Maynooth, Co. Kildare, near Dublin, Ireland [This photograph was taken on October 24, 2022]

1. Get the students to write on their own for 5-10 minutes.

2. Then, in groups of three or four, they see how many scientific terms they have used. They can rank these from the most frequently used to the least frequently used. They can attempt to group them under their headings.

3. Reporting variations:

➢Each group reports to the class. A tally is kept of scientific terms.

➢After the group session has been going on for 10 minutes, one member can visit the adjacent group (going clockwise or counterclockwise) for 2 or 3 minutes to hear what they are saying. They do not contribute to the group discussion but listen to what is being said, and then, after the allotted time, they return to their own group and report back. This is an opportunity to add/clarify/use something that they heard in the other group before reporting back.

➢While taking turns, groups report one observation to the entire class, along with the evidence supporting it. Groups carefully listen to one another to avoid repeating observations.

Extension.

This session can also be extended to facilitate a science activity. The teacher can prepare a web-based activity for students to explore a series of focused questions. This can be done individually, in pairs, or in small groups. It might also be assigned as homework or as a simple "Flipped Classroom" task. Some examples of questions that could be asked are:

- How far is it from Maynooth to Dublin?
- How fast did a horse-drawn barge travel?
- How fast did a steam train travel?
- How fast does a modern passenger train travel?
- What is the average walking speed for an adult?
- How is speed measured?
- How can these various speeds be represented visually?

- How long would it take for a present-day car to complete the journey from Maynooth to Dublin (keeping within the speed limit)?
- How long would it take you to travel from Maynooth to Dublin using each of the different forms of transport possible along or beside the canal?
- What other forms of transport have not been mentioned?

Activity part 2 [Memory-Based Comparison]

After completing part 1, the teacher hides picture 1 and shows the second, slightly different photograph of the same situation (Figure 2).

Figure 2. Photograph 2 of the Royal Canal at the entrance to Carton Estate in Maynooth, Co. Kildare, near Dublin, Ireland

1. Within the same groups, students examine picture 2 and attempt to remember what was in picture 1. They then list the differences between the two images. Students record these differences in two columns of a table, aiming to understand the reasons for the changes, gather evidence to support their claims, and use scientific language appropriate for their level of understanding.

Differences that all group members agree upon	*Differences confirmed only by some members of the group*

2. While taking turns, groups report one observation to the entire class, along with the evidence supporting it. Groups carefully listen to one another to avoid repeating observations.

Activity part 3- optional [Creative Photo Challenge]

1. After completing Activity 1 (and optionally Activity 2), students should take an individual photo on a topic within the teacher's specified boundaries (e.g., geometric patterns, a physics phenomenon that can be explained later, or something evidencing

the current season). This can be an outdoor activity, such as part of a school trip or a task encouraging students to observe their surroundings on their way home or at home.

2. Students upload their photos to a designated folder created by the teacher or share them via communication channels (Messenger, WhatsApp, Signal, etc.) that are accessible and easy to use for all students.

3. In the next lesson, the teacher randomly displays the photos, asking the students who took each to explain their reason for choosing that particular photo and how it relates to the overall purpose established at the start of part 3.

4. (Optional) Students may rank the photos based on a set of rules or their personal opinions.

KEY LEARNINGS

The task has been successfully implemented in multiple workshops and teacher training settings as part of the STAMPEd project and has proven valuable in developing observational and reasoning skills among students. Its adaptable format allows for use across subjects and educational contexts.

In teachers' opinions, the task

- may be utilised in lessons across various subjects
- offers flexibility for implementation in different school curricula topics, including classes addressing ethical, behavioural, and value issues (developmental classes)
- enhances observational skills, such as targeted focus and evidence searching
- fosters meaningful argumentation
- develops scientific language in students
- motivates and engages students through diverse elements (group work, lively discussions, ICT use, social media communication)
- can effectively involve students of different ability levels
- creates a space for students' creativity
- provides opportunities for respectful group discussions
- allows for healthy competition between groups

Key learnings from the implementation

- Let students describe images before guiding them with scientific language. Encourage students to express initial thoughts before prompting them to use scientific terms.
- Use prompts like "What do you think happened just before or after this photo?"
- Encourage students to choose photo subjects that connect to classroom topics.
- Use a projector or shared screen for photo recall comparison.
- A proper selection of pictures can emphasise the unity of the scientific and mathematical worlds, embedding science or mathematics lesson topics in the context of everyday life.

REFERENCES

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APPENDIX

About the photographs

Photographs taken on October 24, 2022, within one minute, using different camera zooms.

The primary photo shows a view of the Royal Canal at the entrance to Carton Estate in Maynooth, Co. Kildare near Dublin in Ireland. The scene includes the Canal (constructed in 1790), Railway line (station opened in 1848, the roadway (to the left) and a recently constructed cycleway (that incorporates the original canal towpath.

Work on constructing the Royal Canal began in 1790, and it served as a major transportation route for many years. Later, the railway was built to run beside the canal, and the Maynooth station opened in 1848. The opening of the railway led to the demise of the canal as a means of transportation. With the invention and mass production of motorised vehicles, public roads became more important and more popular, resulting in railways being used less and less; however, that trend is now reversing. Recent interest in leisure and health activities has prompted the construction of the greenway from Dublin to Mullingar, following the path of the canal.

This site captures historical transitions in transport — from canal to railway to road to cycleway — ideal for science, history, or urban studies.

Implementation Context

The task was implemented on several occasions during the workshops with teachers in the following contexts:

- STAMPEd course, July 2022 (Activities 1 and 3), by Dominic McEvoy
- STAMPEd professional learning community of teachers, in Poland (Activities 1–3), by Dagmara Sokołowska
- II International Teacher Seminar, Krakow, Poland, September 2022 (Activities 1–3), by Dagmara Sokołowska
- III International Teacher Seminar, Krakow, Poland, February 2023, by Dagmara Sokołowska
- Jagiellonian University Workshop for Academic Teachers on Active Learning Strategies, May 2023, by Dagmara Sokołowska.