

## 4.2 Landscape elements

This minimum 2-hour STEAM programme is an excellent combination of science and visual art. By analysing familiar locations like their own school street or local park, students investigate how the placement of large and small objects on a ground plane creates the illusion of depth. Through "peephole" experiments and trial-and-error, students build problem-solving, resilience and flexibility skills by discovering how to manipulate perspective and scale on a 2D surface. The final collage phase fosters creativity, requiring students to make deliberate choices about horizon lines and element overlapping to build a realistic scene. By evaluating each other's work against "real-world" criteria, students practice reason based communication to explain why certain artistic choices look "real" or "impossible." It develops their critical thinking.

### Basic Information Sheet

| Age group             | Student number                    | Duration     | Number of stages | Subjects connection and relevance |
|-----------------------|-----------------------------------|--------------|------------------|-----------------------------------|
| 2 <sup>nd</sup> grade | Whole class<br>(max. 30 students) | min. 2 hours | 3 stages         | Sciences (geography), visual arts |

### STEAM Event Summary

This STEAM program for children aged 6-8 combines knowledge and insights about science and visual arts. Using specific landscape elements linked to a particular environment, the street or the park, the children will make a collage in an (atmospheric) perspective. In the first phase of this Steam lesson, there is a millimetre and weight phase in which the pupils discover 2 types of landscapes according to their specific landscape elements. This is followed by a musical lesson phase in which, starting from observation of images from the children's world, they investigate the suggestion of space and the placement of elements (large/small) in the ground plane (atmospheric perspective). Finally, the pupils create a characteristic landscape (street or park) in a collage where depth is suggested by placing specific landscape elements.

### SPIRIT Skill Focus

- Critical thinking
- Problem-solving
- Creativity



## National curriculum Link and Objectives

- Science Objective: students can describe a landscape using simple landscape elements.
- Art Objective: students can arrange visual elements in a spatial place in a ground plane
- Cross-disciplinary objective: students can use spatial suggestion to represent a specific landscape and its elements in a collage.

## Real-world STEAM Connection and Problem definition

Children like to play in the park. However, the city or village street is something else entirely. Especially if you want to play! We live in different environments that are deliberately constructed to meet specific criteria that enable usefulness, ease of use and safety. Together with the children, we explore 2 such environments, the street and the park. In these we discover e.g. that the park is aimed at relaxation and play but also safety how to make all that possible. By looking critically at our own environment, we discover these landscape elements and clear choices in designing an environment or a landscape. After this, we want to design our own landscape by means of a collage. But how do you get all this on your drawing sheet and make sure that the landscape is right? In this Steam activity, students are also given tools to solve this problem because representing a space, a landscape on your drawing sheet is not that easy. There are many critical choices to make.

## Materials at a Glance

For the Science Phase:

- pictures of 2 types of landscapes near the school

For the Art Phase:

- pictures of landscapes with focus on placing of elements in the ground plane (big/small, near/far)
- view camera

For the Application Phase:

- b/w copies of landscape elements (small/large)
- A3 drawing paper
- glue (Pritt stick)
- scissors
- HB drawing pencil, black coloured pencil/black coloured marker

## Indoor/Outdoor and Classroom layout

Indoor - in the classroom, with the possibility of working outside. This lesson can be translated to an outdoor learning lesson by making some adjustments in its structure and organisation.

Layout:

- have the students work together in islands of 4 (put the benches together 2x2).

## Notes on Research-based approach and integration

This lesson appeals very much to critical thinking. And therefore, needs the student's full attention and involvement. The more the images to be discussed come from the students' immediate environment the more engaged they will remain during this lesson. The combination of scientific concepts and visual research leads to a creative final investigation in which the children were given clear criteria for solving this problem. The more your appeal back critical thinking from the students the more success they will experience in making the creative final assignment. Therefore, dare to build enough test and practice phases into your lesson so that the student arrives at a clever and own final result through trial and error and reflection.

## Lesson Flow Overview (linked to details below)

| Stage | Title                       | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SPIRIT Skills                                                         | Duration   | Link to Details                                       |
|-------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------|-------------------------------------------------------|
| 1st   | Science, landscape elements | <p>The teacher shows pictures of the street in which the school is located (or surrounding streets) but does not say so. Students figure out for themselves that it is the school's street.</p> <p>Then pictures of a park near the school are shown.</p> <ul style="list-style-type: none"> <li>• Students will react enthusiastically because they recognise these places.</li> <li>• Students may already tell what they do in these places and what they recognise.</li> </ul> <p>We are going to look at these 2 places (landscapes) in more detail so that you learn the name of everything you see here.</p> <ul style="list-style-type: none"> <li>• students are given several photos and cards with certain names on them (e.g. A row house)</li> </ul> | <ul style="list-style-type: none"> <li>• Critical thinking</li> </ul> | 40 minutes | <a href="#">STAGE 1 – Science, landscape elements</a> |

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|     |                                                                           | <ul style="list-style-type: none"> <li>students must divide the photos into 2 groups (the street and the park) and put the corresponding name in the right place on the photo.</li> </ul> <p>Based on what the pupils have classified, a short teaching-learning discussion follows. A blackboard diagram is drawn up making clear the difference between the two landscapes (and landscape elements).</p> <p>We classify to 2 categories</p> <ul style="list-style-type: none"> <li>the street</li> <li>the park</li> </ul> <p>The teacher introduces the concepts of landscape, landscape elements, etc.</p> <p>This is followed by a final control phase:<br/>students are shown 4 landscape pictures and must think “critically” whether they are correct or not. E.g. In a busy street, there is a swing in the middle: So, this is not possible? (Note: the “wrong” landscapes were created with ChatGPT)</p> |                                                                                              |            |                                                                                                |
| 2nd | <b>Visual Arts –<br/>space,<br/>placement in<br/>the ground<br/>plane</b> | <p>The teacher shows pictures again through observation (pictures) we look for and name the visual characteristics of a landscape.<br/>But now we look not so much at the elements but at their position and distribution in the overall picture.</p> <ul style="list-style-type: none"> <li>horizon line: the line that becomes visible where air and earth meet</li> <li>Placement and characteristic of that line determine the image that we see of the landscape<br/>-e.g. Brussels Ridge- straight horizon line<br/>Mountain landscape- wavy to angular horizon line</li> </ul>                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>Critical thinking</li> <li>Problem-solving</li> </ul> | 40 minutes | <b><u>STAGE 2 –<br/>Visual Arts –<br/>space,<br/>placement in<br/>the ground<br/>plane</u></b> |

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|  |  | <p>Where is far and what is near in a landscape?</p> <ul style="list-style-type: none"> <li>• how do we see that?</li> <li>• Using landscape elements, we look for criteria for near/far</li> </ul> <p>Emphasis on large and small figures and landscape elements that define depth in an image</p> <p>Let the children specifically perceive the size of the objects in the image and compare.</p> <p>What stands out?</p> <ul style="list-style-type: none"> <li>• large figures/elements mean increasingly closer in the picture</li> <li>• small figures/elements mean further away in the image</li> <li>• how do we see that?</li> </ul> <p>This is followed by a checking phase:</p> <p>We look for other possibilities</p> <ul style="list-style-type: none"> <li>• who is the smallest in the class?</li> <li>• who is the biggest of the class?</li> </ul> <p>Now, in a picture, can we make X bigger than Y?</p> <ul style="list-style-type: none"> <li>• Introduce the peephole board (1 per group of 4)</li> <li>• How?</li> </ul> <p>In groups (islands, benches 2x2) students look for the picture</p> <p>Teacher checks if the picture taken is correct. Students can make smaller objects appear larger than a larger object</p> <p>One or more photos are shown to the class and discussed.</p> |  |  |  |
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| 3rd | <b>Creative application phase: Science and art</b> | <p>Briefly review the criteria for stage 1.</p> <p>Choose now a specific landscape and find these elements in the selection of black and white copies.</p> <ul style="list-style-type: none"> <li>• divide the black and white copies (both landscapes mixed together).</li> </ul> <p>Check: Is their choice of landscape correct?</p> <p>Can they justify their choice?</p> <ul style="list-style-type: none"> <li>• cut out 7 different elements, at least 1 large and 1 very small</li> </ul> <p>Drawing paper is distributed.</p> <ul style="list-style-type: none"> <li>• arrange your cut-out elements from large to small on your sheet of paper.</li> </ul> <p>Check: is this working?</p> <ul style="list-style-type: none"> <li>• look together, validate and evaluate each other's work.</li> </ul> <p>Critical thinking: is this correct?</p> <p>Arrange now your cut-out elements from large to small on your sheet of paper, but with overlap (in front of and behind each other)</p> <ul style="list-style-type: none"> <li>• check: what happens to your image? Could this image be a real landscape?</li> </ul> <p>Critical thinking: is this possible?</p> <p>Drawing a landscape + making a collage with landscape elements</p> <p>You are now going to make your own landscape!</p> <ul style="list-style-type: none"> <li>• take your sheet of paper and lay it horizontally.</li> <li>• We will start by dividing the sheet into two parts (teacher demonstrates all steps)</li> <li>• this is the horizon line</li> </ul> | <ul style="list-style-type: none"> <li>• Critical thinking</li> <li>• Problem-solving</li> <li>• Creativity</li> </ul> | 40 minutes | <p><b><u>STAGE 3 – Creative application phase: Science and art</u></b></p> |
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|  |  | <ul style="list-style-type: none"> <li>• you choose whether to place this line in the middle or at the top</li> <li>• you choose whether this horizon line is straight or curved</li> </ul> <p>The sky goes in the top section. Below that is the ground, where the small and large elements go. (See appendix, teacher also demonstrates this on the blackboard.)</p> <p>Now arrange your cut-out landscape elements on your sheet of paper.</p> <p>Remember, the large elements go at the front and the small ones at the back.</p> <p>The pupils arrange their landscape with their elements on their sheet of paper from near to far (atmospheric perspective).</p> <p>Check: is this correct?</p> <ul style="list-style-type: none"> <li>• Students check each other's work to see if it is correct. Can the image become a real landscape?</li> </ul> <p>Critical thinking: What was closest to your sheet/image?</p> <p>Feedback to blackboard diagram:</p> <ul style="list-style-type: none"> <li>• what was far away?</li> <li>• where do large/small landscape elements come from?</li> </ul> <p>Once the teacher has checked it, you can stick it onto the sheet.</p> <p>Then continue drawing your landscape with a pencil.</p> <p>The teacher walks around and asks individual pupils various questions about the process.</p> <ul style="list-style-type: none"> <li>• why are you putting that element there?</li> <li>• why is this large element in front?</li> <li>• why is the small element behind?</li> </ul> |  |  |  |
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|  |  | <ul style="list-style-type: none"> <li>what kind of landscape did you choose and why?</li> </ul> <p>The pupils draw their landscape with a pencil or black pencil, black markers until their chosen landscape is completely visible.</p> <ul style="list-style-type: none"> <li>They only work in black and white, no colour!</li> </ul> |  |  |  |
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## Tips and Tricks for dealing with challenges (for the whole STEAM program)

- Leaving choices open (which landscape to choose, where and how the horizon line should run) can make the task more straightforward for the students. The fewer open choices there are, the easier the task becomes. However, it should be noted that making everything closed and not giving any freedom of choice also largely excludes critical thinking.

## Difficulty level tailoring notes

- the terminology should be adapted to the student's language level. E.g. the choice of the term 'plants' over 'vegetation'.
- other landscape-shaping layers (glasses) can also be selected. E.g. water, relief, etc. The more landscape-shaping layers are applied in this assignment, the more challenging the Steam lesson becomes.
- when only natural landscapes or layers are considered, the processing material can also be adjusted. For example, only natural materials (leaves, grass, sand, pebbles, twigs, moss, soil, etc.) can be used to create a landscape. This transforms this Steam lesson to an excellent outdoor learning activity.

## STEAM Program Debriefing and Reflection Questions

- What can you see in the landscape?
- Why did you choose this landscape?
- What does the landscape look like?
- What did you find difficult/easy?
- Which landscape would you like to walk around in? Why?
- Which landscapes are most clearly defined according to landscape criteria?
- Which landscape has the most depth? Why?
- Which landscape seems the most "real"? As if it could really exist. Why?



## 4.2.2. Stage details and Activities Flow

### STAGE 1 – Science, landscape elements

#### How does this develop particular SPIRIT skills

Critical thinking becomes very dominantly addressed at this stage. By moving from open-ended questions to criteria and classification, we come to the necessary conclusions. This stage develops critical thinking, problem-solving, and curiosity and openness by requiring students to separate what appears to be real from what is impossible, and to gather even basic information in order to make these decisions. Facts are established which in turn form a basis for new “proper” critical thinking. In order to ensure that this development is truly effective, teachers need to ask guiding questions and prepare lessons that revolve around “Why?” and “How?” and connect visual illusions with reality.

#### What do we want to achieve regarding SPIRIT skill development (student understanding and/or behaviour)?

- students can use simple landscape elements to describe a specific landscape.

#### Materials and tools needed for implementation

- pictures of 2 types of landscapes near the school, PowerPoint, blackboard diagram

#### Preparation notes

- group students into duo's, make a critical selection of pictures to be discussed.

#### Guided Questions

At this stage, questions should focus on helping children justify their decisions. Here are some examples of more specific guiding questions:

- Imagine you're standing here in this picture! What would you most like to do here: run around and play, or look around very carefully to make sure no car is coming?
- I can see you're all thinking about whether that object fits into the picture. Now let's play a game of detective! Find the thing in the picture that wasn't grown by nature but was made by humans, maybe so they'd have a place to live or play!
- When you look at the pictures, what things (elements of the landscape) do you see on every street that aren't there in the park?
- Can a building to live in stand in a park? Do you think we could build a real house right in the middle of the park? Why or why not?
- Does a swing stand in the middle of the street? Do you ever see a swing in the middle of the street in real life? Do you think we could put a playground where cars drive? What do you think why not?
- Do you see footpaths in a park? why yes/why not?

## Stage Debriefing Questions (Optional)

To strengthen reasoning-based problem-solving and critical thinking:

- When you sorted the pictures into “street” and “park” groups, was there an object that made you think it would fit in both places (like a bench or a tree)? How is a bench on the street different from a bench in the park?
- We saw a picture with a “mistake” where there was a swing in the middle of a busy road.
- If you were the urban planner, how would you explain why this scene isn’t just “strange,” but dangerous and “impossible”?
- What criteria would you use to decide whether a completely new object belongs on the street or in a park? What do you think, what is the most important factor to consider when designing parks?

## Tips and Tricks for dealing with stage challenges

- the terminology should be adapted to the student’s language level. E.g. the choice of the term ‘plants’ over ‘vegetation’.
- give enough preference to open-ended questioning, students come to the necessary criteria, but ask through instead of giving the answer themselves
- give students enough opportunity and time to come up with answers
- let them observe in a focused way and name what else can be seen beyond what we observe first.

## STAGE 2 – Visual Arts – space, placement in the ground plane

### How does this develop particular SPIRIT skills

**Critical thinking:** Critical thinking becomes very dominantly addressed at this stage. By moving from open-ended questions to criteria and classification, we come to the necessary conclusions. Facts are established which in turn form a basis for new “proper” critical thinking.

**Problem-solving:** By disconnecting perception from specified photographs but having to take a picture themselves in which far away/small and near/large must form an application they face a problem. Can we manipulate the same in one photograph.

### What do we want to achieve regarding SPIRIT skill development (student understanding and/or behaviour)?

As a result of this activity:

- The students become aware that visual and other information should not simply be accepted, but must be consciously analysed and evaluated based on established rules.
- Based on their visual experiences, they become aware that people can be tricked, and therefore they must evaluate the information they receive.
- They understand the importance of cause-and-effect relationships, which help them recognize when the information available or received is misleading.

## Academic/Curriculum Objective connection

- Describing space and the location of objects in space using space concepts. (big/small, near/further away)
- Create an image (2D or 3D) by consciously placing objects in space

## Materials and tools needed for implementation

- PowerPoint with photos, blackboard diagram, peephole board.

## Preparation notes

- PowerPoint, peephole board (1 each group).

## Guided Questions

- Where are small and large elements in the picture?
- Is the small element really smaller than the large object in the same picture? (E.g. same kind of cars)
- Why is this?
- Does a clear line stand out in a landscape?

## Stage Debriefing Questions (Optional)

- When you looked through the peephole board, how were you able to tricks your eyes? How was it possible to make a smaller object appear larger than an object that was originally larger? Do you think it's possible to trick people this way in other situations? How do you think this can be avoided or prevented?
- We've seen that the horizon line separating the sky from the earth is straight. What would happen to the image if we didn't draw the horizon line straight, but instead in a zigzag or wavy pattern? What kind of landscape would that represent instead of an urban street? Would it improve our mood, or would it have the opposite effect? Can we be tricked in this way into feeling better or worse in a given situation than we would in reality?
- If something on your paper is very small, how can we know that in reality it isn't small, but rather a normal-sized object that's just very far away? What do you think we need to consider in order to decide this?

## Tips and Tricks for dealing with stage challenges

- The structure of this stage is largely the same as the science stage. Crucial here is again to choose images that the children recognise from their own environment but also other images that also play with the (atmospheric) perspective in a funny way. E.g. a zoomed-in nose of a cow in the park's farm.
- Dwell sufficiently on perceiving the size of the objects in the image. If possible, also outline the objects in the picture to make perception more focused for the children and show them clearly that size depends on placement in the picture
- If necessary, you can just point out the objects large and small and their placing. The horizon line gives a foothold in the image for placing but it is not always clearly perceptible and therefore clear in a cityscape.

## STAGE 3 – Creative application phase: Science and art

### How does this develop particular SPIRIT skills

Problem-solving and critical thinking:

Stage 3 is designed in such a way that students must put the knowledge they have acquired in the previous stages (1 and 2) into practice. Without critical thinking, they cannot solve this problem, which involves organising a specific landscape with its own elements into a perspective. It is about making problem-solving thinking explicit and at the same time giving them the tools to form their own answers. This is done in the form of a collage design. Further elaboration through drawing gives them even more opportunities to finish this creatively. Because their own input and the chance of success are high, you automatically have the involvement and motivation of the students in this Steam lesson.

### What do we want to achieve regarding SPIRIT skill development (student understanding and/or behaviour)?

As a result of this activity:

- The students are able to verbally explain their visually-based decisions, responding to questions from the teacher or classmates about why they placed a large or small landscape element in a particular spot. (reason-based decision making)
- The student is able to observe, review, and evaluate the work of their peers, deciding and arguing whether a given artwork depicts a “real” landscape. (Critical thinking)
- They are able to thoughtfully assess their choices and their consequences for the final visual result. In this way, their problem-solving thinking becomes explicit (consciously articulated and visible) in practice.

### Academic/Curriculum Objective connection

- Design a landscape using simple landscape elements (e.g. meadows, trees, houses, streets, squares, parks, rivers, forests, factories, etc.).
- Describing the space and the location of objects in space using spatial concepts (large/small, near/far).
- Creating an image (2D or 3D) by consciously placing objects in space.
- Using spatial suggestion in 2D: using a horizon in a visual work

### Materials and tools needed for implementation

- black and white copies, scissors, A3 drawing paper, glue, drawing pencil, black pencil and/or marker, blackboard diagram.

### Preparation notes

This section aims to develop the given SPIRIT skills through the completion of a complex task (cutting, scaling, masking, gluing, drawing). Teacher preparation (both required materials and conceptual) should focus here on preventing cognitive overload and on step-by-step checking.

- Preparing visual contrasts: When printing black-and-white landscape elements, ensure that the size differences are extreme (very small cars/trees and very large cars/trees). If the difference is too small, 7-year-olds will not perceive spatial depth.

- Rules for gluing: Lay out the pieces and agree on the rules for gluing: students may initially only arrange the cut-out elements on the sheet. They may only glue them down once the teacher or their peers have checked the perspective (large shapes in front, small shapes in back). This promotes trial-and-error-based problem-solving.
- Demonstration of the Horizon Line: During the discussion of the blackboard diagram, do not show a finished picture. Present it step by step: draw a line and ask which part is the sky and which is the ground. Place a small and a large shape on the board and ask the class if they are in the right places, engaging them in critical thinking even before the activity begins.
- Setting up workstations: Arrange the desks into 2x2 “islands.” Set up the space so that students can observe how the person sitting across from them is constructing the landscape.

## Guided Questions

- I see you placed this [name the shape] right here, in this spot. Tell me, what’s going to happen in this part, and why is this the absolute best spot for it in your landscape? (why are you putting that element there?)
- Look, this huge shape is right in front of our noses—it’s practically jumping off the page! If I wanted to walk right into your picture right now, how would you explain to me why this thing looks so big here at the bottom of the page? (why is this large element in front?)
- You placed that tiny figure far away. Imagine if we wanted to walk from the bottom of the page all the way over there! Do you think it would take a long time to get there? How does this small figure help make your landscape seem very deep and distant? (why is the small element behind?)
- If we could magically step into your drawing right now, where would we find ourselves: on a bustling street or in a peaceful park? What was the first thing you chose that made you decide to build this particular world? (what kind of landscape did you choose and why?)

## Stage Debriefing Questions (Optional)

- When you looked at each other’s creations at the very end, how were you able to decide whether a landscape looked “real” or if there was something “impossible” about it? What common rule did you have in mind regarding the large and small paper shapes that helped you make that decision?
- Everyone received the same black-and-white shapes, yet you arranged them differently in front of and behind (overlapping) each other. If someone were to ask you now why you arranged your landscape exactly the way you did, how would you argue that the your final decision solution is the best?
- Was there a moment while you were arranging things when you placed a form on the paper, but when you took a closer look, you realized, “Oops, this looks really weird!”? What was that, and how did you correct your own idea all by yourself, before you even reached for the glue?
- If tomorrow we had to take a picture of our friends in the yard with a real camera in such a way that one of them looks giant and the other looks very small, how would we actually use the trick we figured out today with the paper shapes?

## Tips and Tricks for dealing with stage challenges

- Allow the children to consider the sizes of their cut-out elements by letting them experiment with their landscape image. Therefore, allow them to lay out the sizes and variations before they continue working on their own pieces.
- Encourage them to observe how other groups create and develop their landscapes and consistently engage their critical thinking skills. Encourage them to carefully consider their choices and their consequences.
- Limiting or increasing the number of elements to be cut out makes the assignment easier or more difficult. Adjust this to suit your class.