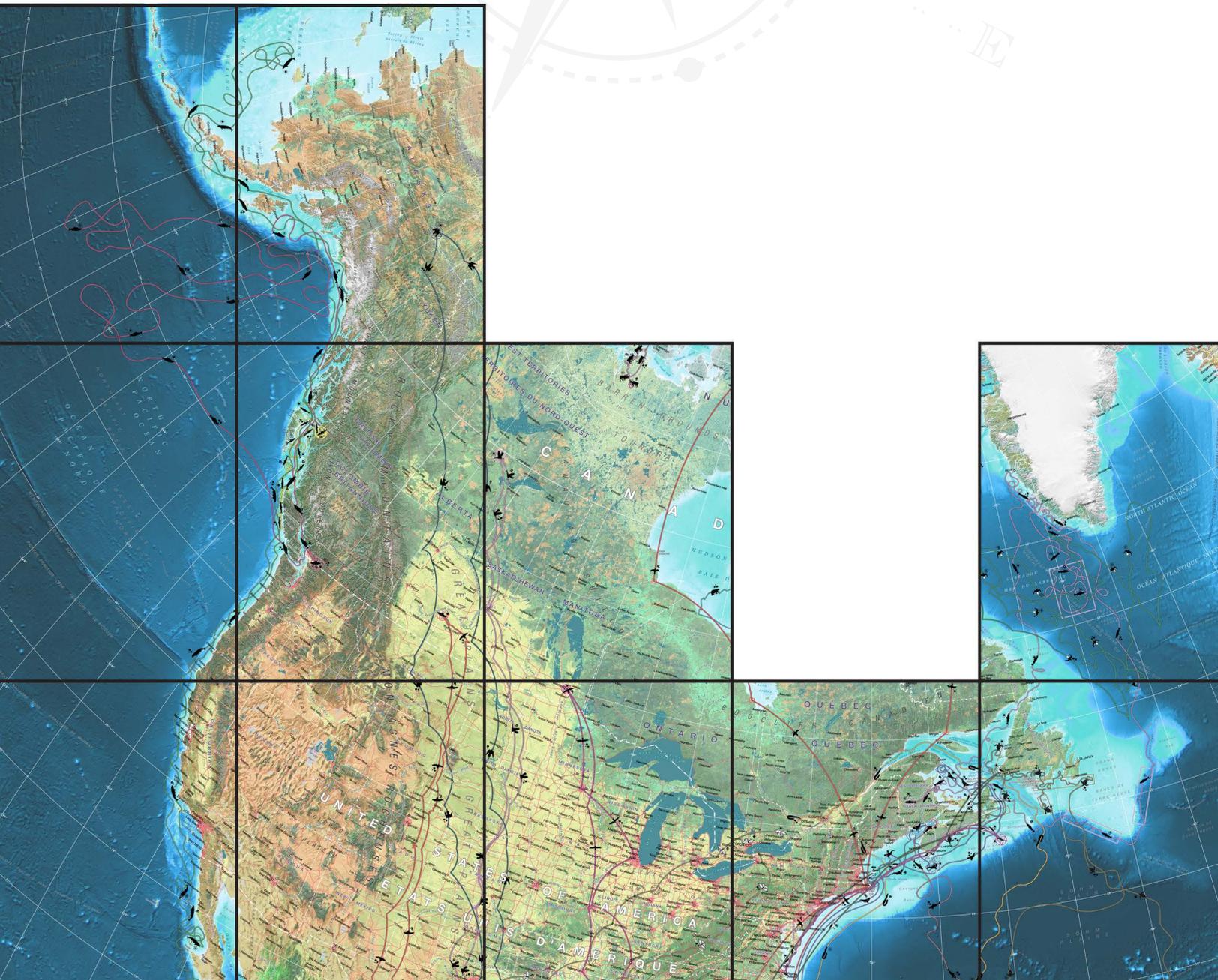


TILED MAPS

INTRODUCTION



INTRODUCTION

Spatial thinking is a powerful and useful geographic skill that strengthens student **collaboration** and **communication** and is key to active citizenship in our increasingly global and technological society. Spatial thinking allows students to identify, understand and analyze phenomena related to the spaces around them, recognizing location, scale, patterns, trends, and relationships.

Canadian Geographic Education, in partnership with the S.M. Blair Foundation, is proud to build on the success of their **tiled map program** and offer this instructional booklet. This resource provides teachers with the opportunity to strengthen their lessons plans and enrich their geography classes with hands-on interactive activities, centred on Can Geo Education's tiled maps. Students will explore the basics of geography, mapping skills, and physical and human geography.

Spatial thinking remains a **fundamental skill** that underpins the geographic toolkit that we aim to impart onto our students over the course of their kindergarten to grade 12 or secondary 5 (Quebec) education.

WHAT ARE TILED MAPS AND HOW CAN YOU INTRODUCE THEM TO YOUR CLASS?

A child's mental image of the world is strongly **influenced** by the representations to which they are exposed, such as **maps and visualizations**. Providing children with access to maps of various types, scales, and media is important to help kids understand the **complexities** and **spatial relationships** between places and phenomena on Earth.

TILED MAPS ARE

- an easy way to introduce your students to new **perspectives**.
- great for group work or **exploration**. They can be used as individual tiles or you can make your own floor map or wallpaper!
- versatile and can be used outside the classroom, on field trips and excursions. They are easy to carry and provide a great way to help students **understand the context** of where they are.
- **modifiable** — you can add labels, annotations, and notes to document ideas and relevant information.
- as **infinite** as your imagination!

OVERVIEW OF ACTIVITIES:



Jigsaw Puzzles:

Consider using the tiles as **puzzle pieces** that need to be put together like a jigsaw. Jigsaw activities require extensive spatial thinking to interpret each tile and then identify its context and location relative to the others. It's a fun way to get children to interact with each other as they work together to figure out who has matching pieces.

INTRODUCTION



Individual Tiles:

Used individually, the map tiles can be examined to understand how smaller locales contribute to **the bigger picture**. Each student can study and research their locale, and then share what they've learned with their classmates. Have your students identify key features and patterns such as natural resources, land use, religious or ethnic communities, and transportation corridors. Ask them to consider how this type of geo-inquiry can provide a mosaic of information when the individual tiles are put together to form a complete map.



Full maps:

As a whole, the tiled maps can be used to explore or discuss ideas with the entire class. Printing out duplicate maps enables groups to work from a common base or template to map out ideas for land-use planning, habitat protection, transportation, etc. They can then use their maps to compare ideas with other groups.

The tiled maps not only engage students in **spatial thinking** and **inquiry-based activities**, they can also provide a platform for assessment. The maps are valuable teaching tools, even for simple exercises to reinforce geographic knowledge or to match place names to locations in the students' minds. Children will be able to **visualize** better and more vivid mental maps, allowing them to form a stronger geographic foundation for future information.

TIPS:

- **Print** out multiple tiled maps, shuffle the pieces of paper together, and then use the tiles as a way to divide students into different groups.
- **Laminate** the tiles, so you can use them again and again. Use a whiteboard marker to temporarily record students' ideas. Have students write on the tiles to provide a more permanent record of their work (easier for assessment).
- Allow them to take their tiles or map **home** for further study and to share what they've learned with their families.
- Use the tiled map as a **floor map** and encourage the students to walk across it! Kinesthetic learners will appreciate the tactile nature and movement associated with this learning opportunity.
- Use the maps for **individual learning**, in-class group activities, or as a whole class. If the tiled map is relevant to a school-wide theme, have each class print out and use their own maps, which can then be shared with other classes.
- Use the maps to learn about map **components** or thematic information.
- Incorporate language arts, art or design by having students present what they have learned through **creative projects**. They can place their art pieces, or QR codes to digital work, on the map to share with the school community.
- Print them in black and white and have students **colour** their maps to show understanding through colour use.

INTRODUCTION

KEY CONCEPTS

In addition to learning about themes and interrelated issues, tiled maps can be used to reinforce **key geographical concepts** and **map components** that are universally relevant, such as scale, projection, direction, latitude and longitude, and legends.

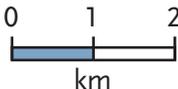


SCALE:

Scale refers to the **ratio** of the map to the real world, and is used to understand the **size** and **distance** between features, as well as the extent of coverage the map provides.

There are three types of scales found on maps.

A scale can be...

1. **Written out** (e.g. 1 cm represents 100 km)
2. **Expressed as a ratio** (e.g. 1:100,000)
3. **Illustrated** as a bar scale which indicates real world distances on the map (e.g. ).

Tiled maps can be printed on different sizes of paper, so it is critical that a bar scale be used, as the scale ratio will change depending on paper size.

A common misunderstanding about scale is the definition of large and small scale. The words “large” and “small” refer to the ratio of the scale, not the area covered. Therefore, a large scale map (e.g. 1:1000) actually covers a small area and usually has a lot of detail. A small scale map (e.g. 1:1,000,000) covers a much larger area, but there is far less detail. Think of it as a pizza slice. 1/1000th of a pizza is larger than 1/1,000,000th of a pizza!

Using tiled maps to teach scale:

- Use the scale to determine the **distance covered** by the width of an individual tile, the amount of ground covered by each individual tile in square kilometres, or the total amount of territory covered by the whole map.
- Compare bar scales on printed map tiles of various sizes, and calculate the **scale ratio** to help reinforce the idea of large and small scale.
- Compare **map distances** from two common points on printed map tiles of various sizes to reinforce learning about map scale.
- Determine **real world distances** using the bar scale. Real world distances are often difficult for children to comprehend, so support this learning by determining how long it would take to walk or drive that distance.

INTRODUCTION



PROJECTION:

Projection refers to the way in which a map is created to show a **3-dimensional Earth in 2-dimensions on paper**. It is impossible to flatten the Earth without distorting it. Consider an orange peel: If you peel the orange and lay it flat, it will not look like a perfect circle. It is the same with the Earth. There will always be some **distortions** evident, especially in small scale maps, which cover larger areas. If the distortions inherent in a projected map are not recognized, they can lead to misunderstandings of the size, shape, and distribution of features on the Earth's surface.

Using tiled maps to teach projection:

- **Compare different types of maps**, including a globe or a virtual globe like Google Earth, to your tiled map. Identify areas where the shapes and size of the features are distorted due to the type of projection used. Often, the expanse of northern Canada is stretched out in wall maps of the world, particularly with Mercator projection maps.
- **See if projection issues are visible** in the individual tiles or if they're more noticeable when the map is put together.



DIRECTION:

The cardinal (also known as chief or primary) directions (north, south, east and west) are used throughout the world, and provide an easy way to describe **absolute direction**, as well as **relative location**. The map as a whole can be used to describe direction, or each student can take a tile and learn about direction with their own tile.

Using tiled maps to teach direction:

- Compile the map by placing tiles together according to **direction** (e.g. start in the south and build the map northwards, or ask students to add tiles from east to west). Be explicit about the direction of each new tile relative to the existing map.
- Have the students create a **compass rose** on a tile, and indicate the cardinal (N, S, E, W) and intercardinal (NE, NW, SE, SW) directions.
- Create a **scavenger hunt** by combining direction and scale. Give students instructions on how to reach a specific destination and have them answer questions about different areas along the way.



INTRODUCTION



LONGITUDE AND LATITUDE:

While it is possible to describe relative location by using cardinal directions, you can determine absolute location using a **coordinate system**. Longitude and latitude coordinates are used around the world and are present in various technologies, with which students may already be familiar. Use the tiled map to emphasize how latitude describes the distance north or south of the Equator, and longitude describes location east or west of the Prime Meridian. This is an important concept to reinforce, no matter what level the student is at or if they have already learned about latitude and longitude. If they haven't learned it yet, the tiled maps can help support this new learning experience.

Using tiled maps to teach latitude and longitude:

- When compiling the tiled map, be explicit about how **latitude** is changing for each **row** added, and how **longitude** is changing for each **column** added.
- When the map is compiled, give the students some **coordinate pairs** and ask them to identify in which tiles those locations occur.
- Have students determine the coordinates for **specific features** on the tiled map, or on individual tiles.
- On individual tiles, have students mark which way **latitude values increase**, and which way **longitude values increase**. Combining this with the concept of the compass rose reinforces the relationship of latitude and longitude with direction.
- Between degrees of latitude, the distance is approximately **111 km**. This is another measure you can use to estimate **scale**. Keep in mind that the distance between the degrees of longitude shrink with distance from the Equator, as they converge on the poles.
- Latitude values range from **0° to +90°** (Equator to North Pole) **0° to -90°** (Equator to South Pole). Longitude varies from **0° to +180°** (Prime Meridian to International Date Line going east) and **0° to -180°** (Prime Meridian to International Date Line going west). Canada is situated between latitudes +41° and +84° and longitude -52° and -141°.
- Degrees of latitude and longitude are divided up the same way as **time**, each degree having 60 minutes and each minute having 60 seconds. The tiled maps can be used to practice latitude and longitude values in degrees, but also in **minutes and seconds**.

INTRODUCTION



LEGEND:

Often called the “**Key**”, the legend lives up to this name by **providing information necessary to deciphering the map** and extracting meaning from it. The information found in legends can be used to demonstrate different types of geographic data. There are **points** (i.e. site specific locations, often settlements), **lines** (e.g. rivers, roads, railways, borders), and **polygons**, which represent areas (e.g. national parks, reserves, outline boundaries of major cities, electoral districts). Symbols are point symbols that represent important features on the map, and will be defined in the legend. Ensure your students are able to see, read and understand the legend before beginning any work with the map.

Using tiled maps to teach about legends:

- If you want to introduce the concept of a legend, **have students create one**, from either an individual tile, or from the compiled map before they view the provided legend.
- Using the provided legend, you can assess students’ map reading skills by giving each student a tile and having them **identify and mark specific features** on the tile.
- To make connections to other places in the world, discuss what **legend items wouldn’t be relevant** in another area of the world, and what other items would have to be included.