

# The Ins and Outs of Hiking Backpacks

## Lesson Overview

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During this lesson, students will examine the different styles, sizes, and design of backpacks before leaving on the trip. They will discuss the weight and distribution of items when filling a backpack and how to carry a heavy backpack safely. They will also learn how to pack the backpack efficiently and for ease of use.

## Overall and Specific Expectations

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- PPL 10: 1, 1.5; A3, A3.1
- PPL 20: 1, 1.5; A3, A3.1
- PPL 30: 1, 1.5; A3, A3.1
- PPL 40: 1, 1.5; A3, A3.1

## Learning Goals

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- I can behave responsibly and apply appropriate safety rules and procedures that maximize my safety and that of others during outdoor activities.
- I can think critically to analyze situations, evaluate my choices and make safe decisions in a variety of situations.

## Materials

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- 2 water bottles

- Backpack (20–45 liters)
- Bag/container with food for the trip
- External frame pack, for demonstration purposes only
- Internal frame pack (70–90 liters)
- Other personal and group items
- Personal clothing, including rain jacket and rain pants
- Sleeping bag and sleeping pad
- Stove and fuel
- **Student Resource: The Ins and Outs of Hiking Backpacks - Observation Sheet**
- Tarp and tent

## Ontario Physical Activity Safety Standards in Education

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### Activity

#### **Backpacking/Hiking (Backcountry)**

### Tools and Resources

- **Concussions**
- **Disability-Centred Safety**
- **First Aid Plan and First Aid Emergency Response**
- **Outside Activity Providers**

### Other

#### **Risk Management**

## Assessment for Learning

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At the beginning of the lesson, work with students to co-create criteria for assessing knowledge and skills needed to apply safety rules and procedures during outdoor education activities. Consult the *Student Resource: The Ins and Outs of Hiking Backpacks - Observation Sheet* for sample criteria.

As part of the activity, have students show how to appropriately prepare, carry, and adapt their backpack for a trip according to their own weight and their body. Offer verbal feedback, keeping the criteria below in mind. Consider using the *Student Resource: The Ins and Outs of Hiking Backpacks - Observation Sheet* to gather evidence of student learning.

After the activity, review the co-created criteria with students, and then have them complete their *Student Resource: The Ins and Outs of Hiking Backpacks - Observation Sheet*.

Collect and review the *Student Resource: The Ins and Outs of Hiking Backpacks - Observation Sheets*. Use the co-created criteria and a master observation sheet to evaluate student learning and offer feedback. If needed, provide feedback to individual students or the entire group, to clarify or reinforce their understanding of backpacking safety, and answer any remaining questions.

## Minds On

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Explain to the students that the group is planning a backcountry hiking trip and they need to make a list of equipment to bring. If possible, weigh the various items to determine the total equipment weight for the group, and then divide the weight by the number of participants taking part in the trip. Remember to include the weight of filled water bottles, snacks, and food.

Spread the equipment evenly among participants, so the weight is distributed. Check that the equipment will also be transported in the appropriate fashion for varying terrain. Have the group consider how to share the responsibility for carrying the necessary equipment throughout the trip keeping in mind that the weight of some items will diminish over the course of the trip.

# Action

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## Basic Backpack Anatomy

Use a filled 70–90-liter pack as an example for discussing basic pack elements, or you can show the classes the images on a screen.

The basic elements of a backpacking pack are:

- Inner frame and stays
- Shoulder straps
- Hip belt
- Upper pocket
- Compression straps
- Load lifters
- Hip stabilizers
- Sternum strap

These elements work together to help a person safely carry heavy loads while minimizing physical stress on the body and allowing the person to navigate tricky terrain more easily and enjoy each day with the group.

Provide students with an opportunity to carry fully loaded packs. Have them adjust the various straps so they have hands-on experience with how these change weight distribution in the pack. Make sure they understand how this helps them while hiking with the pack on.

## Weight Distribution in a Backpack

Have students evaluate the items placed in the backpack, the frequency with which they will use each one, and its weight/mass.

The general rule is to place the heaviest items close to the back, between the shoulders and hips. Placing heavy items in the upper part of the backpack may cause problems with balance and footing, and other safety issues while hiking uphill. Placing all heavy items at the bottom of the backpack may cause problems with balance while going downhill and may require frequent adjustment of the straps. The full weight of the pack should rest on the hips, with the hip belt, which is why heavier items should be placed close to the back and above the hips.

Weigh each backpack. In general, a backpack should not weigh more than 25% of the transporting student's weight.

## Additional Tips

- Place rain gear at the top of the backpack along with the first aid kit and snacks for the day.
- Put any stove fuel in one of the exterior side pockets, or at least under the food and first aid kit, in order to prevent any wasted materials due to a fuel leak.
- There are two ways to waterproof a backpack:
  - Add an outer layer, such as a garbage bag. Everything will be waterproofed. However, it will be more challenging to get to items quickly if it rains, because this added layer will need to be removed to reach items in the pack.
  - Waterproof each smaller section of a backpack, thus making access much easier.
- Make sure to have easy access to water bottles without taking the backpack off. This will help to stay hydrated all day.
- Create a schedule for how group gear and food will be carried throughout the trip, remembering that fuel and food will begin to weigh less even after the first meal. It helps to share the responsibility for carrying the group equipment.

## Consolidation

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Have students prepare their backpacks and assess techniques used by their classmates for weight distribution.

Evaluate which backpack is easiest to carry, which has more uniform weight distribution, which is best waterproofed, etc.

Ask the smallest person in the class to try carrying the backpack of the biggest person in the class by modifying contents using the backpack's features. Ultimately, though, each backpack should be prepared and adapted for the person carrying it.

## Notes to Teachers

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There are many images online that show how to pack a backpack, as well as where to place certain items. Find one relevant to the chosen outdoor activity, or co-create one with students based on the required equipment, clothing and food for the activity

Remember to check school board policies and procedures applicable to any outdoor education activity.