



HUMAN FACTORS & ERGONOMICS



STUDENT LESSON
PLANS

University of Rhode Island



BACKPACK POSTURE



University of Rhode Island

LESSON PLAN

BACKPACK POSTURE

PURPOSE

To understand how backpack posture affects the human body and why it is important to safely carry heavy weight.

BACKGROUND INFORMATION

Did you know that National Backpack Safety Awareness Day is September 18th? Knowing what to look for when purchasing a new backpack is important and varies from person to person. Some primary factors to consider are your size and the quality of the backpack itself. Carrying a backpack that does not fit well can cause long-term posture and spine health issues.

A backpack that is fitted properly will not be wider or longer than your torso. It should also not hang more than 3-4" below your waist. Next, a backpack with proper support should have two padded shoulder straps and a waist or chest strap. Preferably, these straps should also be wide and adjustable to prevent digging into the skin. It is also helpful to find a backpack that has multiple compartments to distribute the weight evenly.

Lightweight material is also beneficial because it is important that your backpack does not exceed 10-15% of your total body weight.

APPLICATION TO HF&E

Backpacks are used by millions of students every school year. However, a large number of these students are unknowingly jeopardizing their posture and spine health by practicing poor backpack safety. In HF&E, it is not just important to understand proper backpack safety but also how ergonomic design in products can have severe long-term health effects.





LESSON PLAN GRADES 7 - 9



University of Rhode Island

BACKPACK POSTURE TEACHER MATERIALS



YOUTUBE LINK

Hampton Primary School - "Backpack Safety Tips - Is Your Child's Backpack Safe?"
https://www.youtube.com/watch?v=y9j9_7vJRyU

KEY TAKEAWAYS

- Check straps and backpack sizes before purchasing based on child's size
- Adjust straps so that the bottom of the backpack is no more than 4 inches below the waist
- Wear your backpack with both straps on each shoulder
- A backpack should weigh no more than 10% of the child's bodyweight
- Place the heaviest books into the backpack on the side nearest the child's back

REFLECTION

1. What are some reasons that it is important to wear your backpack correctly?
2. Did you notice a difference when you adjusted your backpack correctly? What changes did you notice?
3. Do you think that your backpack could have been designed to be more ergonomic? If so, what would you improve?

BACKPACK POSTURE TEACHER MATERIALS

LENGTH OF COMPLETION

45 minutes

BILL OF MATERIALS

Backpack (~\$20 on Amazon)

Ruler (\$2 on Amazon)

5 pound weight (\$6 Amazon) or items that add up to approximately 5 pounds

Pencil and paper

PROCEDURE

1. Show students the video from the previous page about backpack safety
2. Divide students into pairs (Student A and Student B)
3. Have Student A and Student B empty their backpacks
4. Next, have Student A put on their empty backpack using both shoulder straps on each shoulder and loosened as much as possible
5. Student B will place a heavy textbook or weight (5 pounds)
6. Measure the distance below the waist to the bottom of the backpack with the ruler
7. Student A in a circle around the room one time and return to Student B
8. Student A will now write down on a piece of paper how comfortable the backpack felt on a scale from 1 (not comfortable at all) - 10 (very comfortable)
9. Repeat Steps 4 - 8 with Student B
10. Next, Student A will put on their empty backpack and adjust the shoulder straps tight
11. Student A will repeat Steps 5 - 8
12. Lastly, Student B will put on their empty backpack and adjust the shoulder straps tight
13. Student B will repeat Steps 5 - 8



BACKPACK POSTURE STUDENT HANDOUT

LENGTH OF COMPLETION

45 minutes

BILL OF MATERIALS

Backpack (~\$20 on Amazon)

Ruler (\$2 on Amazon)

5 pound weight (\$6 Amazon) or items that add up to approximately 5 pounds

Pencil and paper



YOUTUBE LINK

Hampton Primary School - "Backpack Safety Tips - Is Your Child's Backpack Safe?"

https://www.youtube.com/watch?v=y9j9_7vJRyU

KEY TAKEAWAYS

- Check straps and backpack sizes before purchasing based on child's size
- Adjust straps so that the bottom of the backpack is no more than 4 inches below the waist
- Wear your backpack with both straps on each shoulder
- A backpack should weigh no more than 10% of the child's bodyweight
- Place the heaviest books into the backpack on the side nearest the child's back

BACKPACK POSTURE STUDENT HANDOUT

PROCEDURE

1. Show students the video from the previous page about backpack safety
2. Divide students into pairs (Student A and Student B)
3. Have Student A and Student B empty their backpacks
4. Next, have Student A put on their empty backpack using both shoulder straps on each shoulder and loosened as much as possible
5. Student B will place a heavy textbook or weight (5 pounds)
6. Measure the distance below the waist to the bottom of the backpack with the ruler
7. Student A in a circle around the room one time and return to Student B
8. Student A will now write down on a piece of paper how comfortable the backpack felt on a scale from 1 (not comfortable at all) - 10 (very comfortable)
9. Repeat Steps 4 - 8 with Student B
10. Next, Student A will put on their empty backpack and adjust the shoulder straps tight
11. Student A will repeat Steps 5 - 8
12. Lastly, Student B will put on their empty backpack and adjust the shoulder straps tight
13. Student B will repeat Steps 5 - 8



REFLECTION

1. What are some reasons that it is important to wear your backpack correctly?
2. Did you notice a difference when you adjusted your backpack correctly? What changes did you notice?
3. Do you think that your backpack could have been designed to be more ergonomic? If so, what would you improve?



LESSON PLAN GRADES 10 -12



University of Rhode Island

BACKPACK POSTURE TEACHER MATERIALS



YOUTUBE LINK

Hampton Primary School - "Backpack Safety Tips - Is Your Child's Backpack Safe?"

https://www.youtube.com/watch?v=y9j9_7vJRyU

KEY TAKEAWAYS

- Check straps and backpack sizes before purchasing based on child's size
- Adjust straps so that the bottom of the backpack is no more than 4 inches below the waist
- Wear your backpack with both straps on each shoulder
- A backpack should weigh no more than 10% of the child's bodyweight
- Place the heaviest books into the backpack on the side nearest the child's back

REFLECTION

1. What are some reasons that it is important to wear your backpack correctly?
2. Did you notice a difference when you adjusted your backpack correctly? What changes did you notice?
3. Do you think that your backpack could have been designed to be more ergonomic? If so, what would you improve?
4. Based on what you have learned, do you think you need to purchase a new backpack?

BACKPACK POSTURE TEACHER MATERIALS

LENGTH OF COMPLETION

45 minutes

BILL OF MATERIALS

Backpack (~\$20 on Amazon)

Ruler (\$2 on Amazon)

5 pound weight (\$6 Amazon) or items that add up to approximately 5 pounds

Pencil and paper

PROCEDURE

1. Show students the video from the previous page about backpack safety
2. Divide students into pairs (Student A and Student B)
3. Have Student A and Student B empty their backpacks
4. Next, have Student A put on their empty backpack using both shoulder straps on each shoulder and loosened as much as possible
5. Student B will place a heavy textbook or weight (5 pounds)
6. Measure the distance below the waist to the bottom of the backpack with the ruler
7. Student A in a circle around the room one time and return to Student B
8. Student A will now write down on a piece of paper how comfortable the backpack felt on a scale from 1 (not comfortable at all) - 10 (very comfortable)
9. Repeat Steps 4 - 8 with Student B
10. Next, Student A will put on their empty backpack and adjust the shoulder straps tight
11. Student A will repeat Steps 5 - 8
12. Lastly, Student B will put on their empty backpack and adjust the shoulder straps tight
13. Student B will repeat Steps 5 - 8



BACKPACK POSTURE STUDENT HANDOUT

LENGTH OF COMPLETION

45 minutes

BILL OF MATERIALS

Backpack (~\$20 on Amazon)

Ruler (\$2 on Amazon)

5 pound weight (\$6 Amazon) or items that add up to approximately 5 pounds

Pencil and paper



YOUTUBE LINK

Hampton Primary School - "Backpack Safety Tips - Is Your Child's Backpack Safe?"

https://www.youtube.com/watch?v=y9j9_7vJRyU

KEY TAKEAWAYS

- Check straps and backpack sizes before purchasing based on child's size
- Adjust straps so that the bottom of the backpack is no more than 4 inches below the waist
- Wear your backpack with both straps on each shoulder
- A backpack should weigh no more than 10% of the child's bodyweight
- Place the heaviest books into the backpack on the side nearest the child's back

BACKPACK POSTURE STUDENT HANDOUT

PROCEDURE

1. Show students the video from the previous page about backpack safety
2. Divide students into pairs (Student A and Student B)
3. Have Student A and Student B empty their backpacks
4. Next, have Student A put on their empty backpack using both shoulder straps on each shoulder and loosened as much as possible
5. Student B will place a heavy textbook or weight (5 pounds)
6. Measure the distance below the waist to the bottom of the backpack with the ruler
7. Student A in a circle around the room one time and return to Student B
8. Student A will now write down on a piece of paper how comfortable the backpack felt on a scale from 1 (not comfortable at all) - 10 (very comfortable)
9. Repeat Steps 4 - 8 with Student B
10. Next, Student A will put on their empty backpack and adjust the shoulder straps tight
11. Student A will repeat Steps 5 - 8
12. Lastly, Student B will put on their empty backpack and adjust the shoulder straps tight
13. Student B will repeat Steps 5 - 8



REFLECTION

1. What are some reasons that it is important to wear your backpack correctly?
2. Did you notice a difference when you adjusted your backpack correctly? What changes did you notice?
3. Do you think that your backpack could have been designed to be more ergonomic? If so, what would you improve?
4. Based on what you have learned, do you think you need to purchase a new backpack?