

## Risk Management Strategies



## Risk Management Strategies

### Part 1

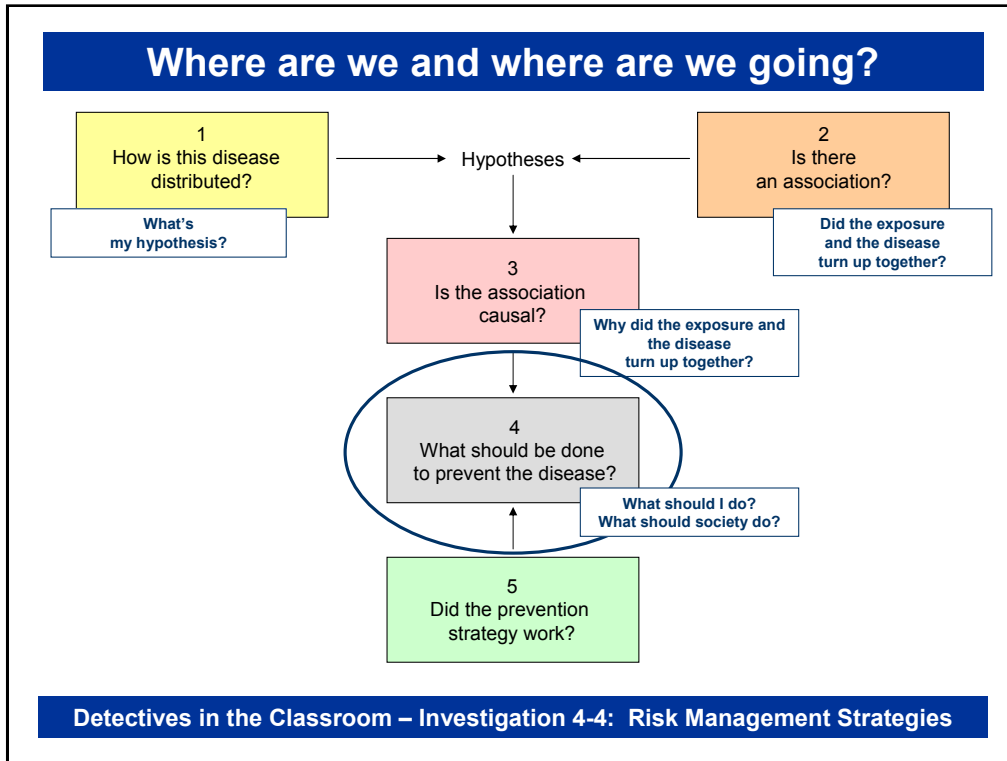
Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

**Investigation 4-4: Risk Management Strategies** is divided into two parts and takes two class periods to complete.

In Part 1, students will develop a personal and societal risk management strategy to reduce the level of risk posed by carrying heavy backpacks. In preparation for this class, they will have read assigned articles on backpacks and back pain.

In Part 2, students will continue to develop and refine their societal risk management strategy, critique their strategies in terms of their considerations for judging the acceptability of a risk, and communicate their strategy to appropriate stakeholders.

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Remind students again that in the Module 4 investigations, they are learning how to answer the Fourth Essential Question: “What should be done to prevent the disease?”

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## Review

### Epi Talk

#### Risk

A measure of how often an event occurs in a defined group of people in a defined period of time.

The likelihood of developing a disease.

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Review the definition of “Risk.”

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## Review

### Epi Talk

#### Risk Perception

One's feeling or opinion of the existence or size of a risk.

One's estimate of the likelihood that an undesirable consequence, associated with some activity, will occur within a period of time.

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Review the definition of “Risk perception.”

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## Review

Epi Talk

### Acceptable Risk

The degree to which an individual or society is willing to tolerate the existence of something that poses a danger.

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Review the definition of “Acceptable risk.”

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**Epi Talk**

**Prevent**  
To keep something from happening.

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Ask students to find “Prevent” in the **Epi Talk** list.  
Review its definition.

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**Epi Talk**

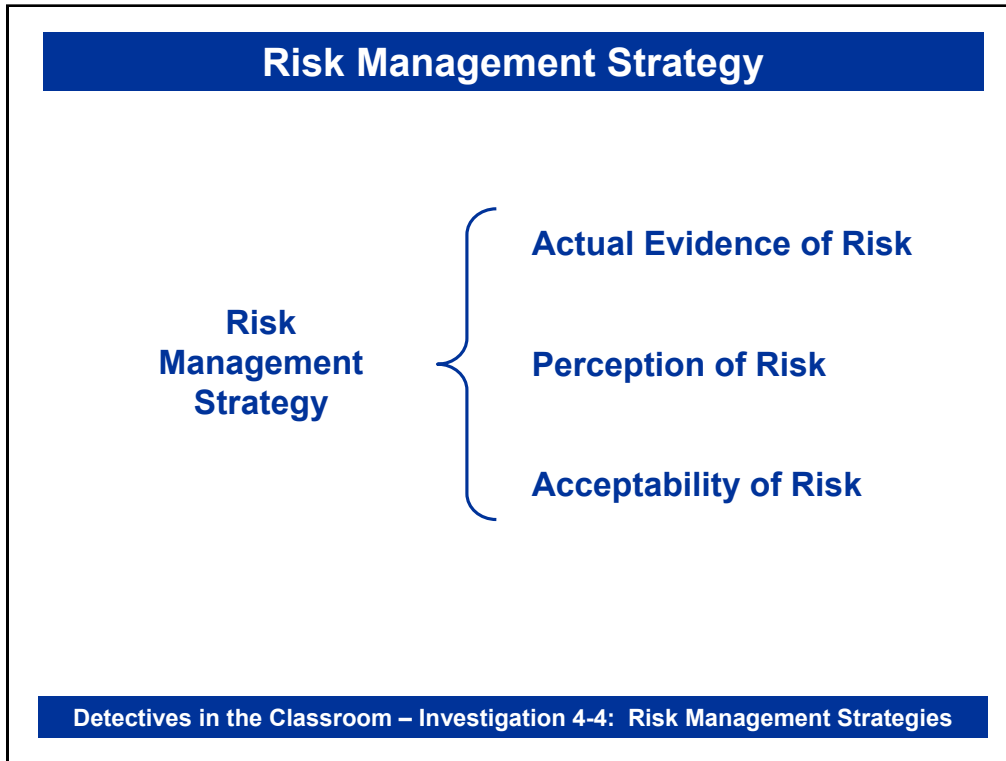
**Epi Talk**

| <b>Risk Management</b>  |
|---|
| Steps taken to reduce the levels of risk to which an individual or a population is exposed. |
|   |
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|   |

**Detectives in the Classroom – Investigation 4-4: Risk Management Strategies**

Ask students to find “Risk management” in the **Epi Talk** list.  
Review its definition.

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When developing a risk management strategy, the following must be considered: the actual evidence of risk (science) as well as people’s perception of the risk and acceptability of risk considerations.

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## Carrying Heavy Backpacks Causes Back Pain



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Students should now take out the backpack/back pain articles that they read for Part 1 of this Investigation.

Ask students:

- Do the articles support the hypothesis “carrying heavy backpacks causes back pain”? (Yes)

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## Carrying Heavy Backpacks Causes Back Pain

### Risk Management

Steps taken to reduce the levels of risk to which an **individual** or a population is exposed.

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Ask students:

- What would you do *individually*, based on the evidence that carrying heavy backpacks causes back pain?

☀ Teacher Alert: Keep the discussion focused on what students would do *individually*. At this point in the investigation, do not discuss what should be done about the risk to *others*. This will be addressed next.

Ask students:

- Is this risk acceptable to you *individually*?
- Would you live with this risk or would you, *individually*, do something to reduce the risk of being hurt from carrying heavy backpacks?

Discuss.

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## Epi Teams



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Divide the class into Epi Teams of four or five students per team.

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## Carrying Heavy Backpacks Causes Back Pain

### Risk Management

Steps taken to reduce the levels of risk to which an individual or a **population** is exposed.

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Without engaging in discussion, instruct students to think about what should be done for children in general. In other words, based on the evidence that supports the hypothesis “carrying heavy backpacks causes back pain,” what should be done to reduce the risk posed to the *population*?

☀ Teacher Alert: To encourage a variety of responses from the different Epi Teams, do not engage students in class discussion at this point in the investigation.

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## Epi Log Worksheet

Defectives in the Classroom Name: \_\_\_\_\_  
Investigation 4-4 Epi Log Worksheet Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Risk Management Strategies

1. Epi Team strategy to reduce the level of risk posed by carrying heavy backpacks to the population:


a. \_\_\_\_\_ 2. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_  
f. \_\_\_\_\_  
g. \_\_\_\_\_

Defectives in the Classroom – Investigation 4-4: Risk Management Strategies

Without further discussion, give each student an **Investigation 4-4: Epi Log Worksheet**.

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Epi Log Worksheet
1



Detectives in the Classroom Name: \_\_\_\_\_ Date: \_\_\_\_\_

Investigation 4-4 Epi Log Worksheet Risk Management Strategies

1. Epi Team strategy to reduce the level of risk posed by carrying heavy backpacks:

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

e. \_\_\_\_\_

f. \_\_\_\_\_

g. \_\_\_\_\_

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Working in their Epi Teams, students should take Step 1 on their **Investigation 4-4: Epi Log Worksheets** by listing measures they think should be taken to reduce the level of risk to the *population* that is posed by carrying heavy backpacks at school.

They have 10 minutes to complete this task.

☀ Teacher Alert: Students' suggestions may include the following:

- Ban heavy backpacks.
- Regulate industry. (Example: decrease backpack size)
- Regulate sales. (Example: sell backpacks based on the size of the student)
- Mandate technology controls in backpacks that reduce the likelihood of harm. (Example: wheels)
- Increase school supervision. (Example: size checks at school, empty backpacks of all unnecessary items)
- Provide prevention ideas. (Example: back strengthening exercises)
- Restructure school rules. (Example: more stringent penalties for carrying heavy backpacks, such as detention, suspension, community service)
- Financial incentives. (Example: increase fines for carrying heavy backpacks)
- Education. (Example: early grade school, young adults, general population, in the media)

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## Presentation Rubric

| Criteria                               | Got It                           | Getting It                        | Will Get It Soon                  |
|--|----------------------------------|-----------------------------------|-----------------------------------|
| Participation                          | All participate                  | Most participate                  | Some participate                  |
| Use of Epi Talk                        | All are appropriate and accurate | Most are appropriate and accurate | Some are appropriate and accurate |
| Consideration of Actual Risk           | Thoughtfully considered          | Considered                        | Not considered                    |
| Consideration of Perceived Risk        | Thoughtfully considered          | Considered                        | Not considered                    |
| Consideration of Acceptability of Risk | Thoughtfully considered          | Considered                        | Not considered                    |

### Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

After allowing 10 minutes for Epi Team discussion, give the students 10 more minutes to prepare for discussion of their Epi Team's risk management strategy with the class.

They should use the criteria in the **Presentation Rubric** as a basis for preparation. Review the **Presentation Rubric** to be used when evaluating the presentation.

- Participation: All participate.
- **Epi Talk**: All are appropriate and accurate.
- Consideration of Actual Risk: Thoughtfully considered.
- Consideration of Perceived Risk: Thoughtfully considered.
- Consideration of Acceptability of Risk: Thoughtfully considered.

Give each student a **Presentation Rubric**.

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# Epi Log Worksheet

2

Defectives in the Classroom Name: \_\_\_\_\_  
Investigation 4-4 Epi Log Worksheet Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Risk Management Strategies

1. Epi Team strategy to reduce the level of risk posed by carrying heavy backpacks to the population:

a. \_\_\_\_\_ 2. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_  
f. \_\_\_\_\_  
g. \_\_\_\_\_

Defectives in the Classroom – Investigation 4-4: Risk Management Strategies

Each Epi Team should complete Step 2 on the **Investigation 4-4: Epi Log Worksheet** by identifying the Epi Team members who will present each step of the team's risk management strategy.

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## Presentation Rubric

| <u>Criteria</u>                               | <u>Got It</u>                    | <u>Getting It</u>                 | <u>Will Get It Soon</u>           |
|---|----------------------------------|-----------------------------------|-----------------------------------|
| <u>Participation</u>                          | All participate                  | Most participate                  | Some participate                  |
| <u>Use of Epi Talk</u>                        | All are appropriate and accurate | Most are appropriate and accurate | Some are appropriate and accurate |
| <u>Consideration of Actual Risk</u>           | Thoughtfully considered          | Considered                        | Not considered                    |
| <u>Consideration of Perceived of Risk</u>     | Thoughtfully considered          | Considered                        | Not considered                    |
| <u>Consideration of Acceptability of Risk</u> | Thoughtfully considered          | Considered                        | Not considered                    |

**Detectives in the Classroom – Investigation 4-4: Risk Management Strategies**

Allow each Epi Team 5 minutes to present its risk management strategy to the class.

After each presentation, ask students from the other Epi Teams if they have any questions and discuss as needed.

Continue in the same manner until all Epi Teams have presented.

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## Self-Assessment

| Criteria                               | Got It                           | Getting It                        | Will Get It Soon                  |
|--|----------------------------------|-----------------------------------|-----------------------------------|
| Participation                          | All participate                  | Most participate                  | Some participate                  |
| Use of Epi Talk                        | All are appropriate and accurate | Most are appropriate and accurate | Some are appropriate and accurate |
| Consideration of Actual Risk           | Thoughtfully considered          | Considered                        | Not considered                    |
| Consideration of Perceived of Risk     | Thoughtfully considered          | Considered                        | Not considered                    |
| Consideration of Acceptability of Risk | Thoughtfully considered          | Considered                        | Not considered                    |

### Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

After all of the Epi Team presentations, ask a student to assess each presentation in terms of the **Presentation Rubric's first criterion**, Participation: All participate.

Ask another student to assess each presentation in terms of the *second criterion*, **Epi Talk**: All are appropriate and accurate.

Ask another student to assess each presentation in terms of the *third criterion*, Consideration of Actual Risk: Thoughtfully considered.

Ask another student to assess each presentation in terms of the *fourth criterion*, Consideration of Perceived Risk: Thoughtfully considered.

Ask another student to assess each presentation in terms of the *fifth criterion*, Consideration of Acceptability of Risk: Thoughtfully considered.

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## Epi Team Risk Management Strategies

The image shows four overlapping worksheets, each titled "Detectives in the Classroom - Investigation 4-4: Risk Management Strategies". Each worksheet includes a header with "Name:" and "Date: / /", followed by the title "Detectives in the Classroom" and "Investigation 4-4 Epi Log Worksheet". Below the title, there is a section for "Risk Management Strategies" with a numbered list starting with "1. Epi Team strategy to reduce the level of risk posed by carrying heavy backpacks to the population." The worksheets are arranged in a descending staircase pattern from top-left to bottom-right, with the bottom-most worksheet being the most prominent and showing more of its content.

### Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Now have students take elements from different strategies presented in class and develop a better policy.

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**Epi Log Worksheet**

**3**

3. Class strategy to reduce the level of risk posed by carrying heavy backpacks to the population.

a.

b.

c.

d.

e.

4.

**Detectives in the Classroom – Investigation 4-4: Risk Management Strategies**

Students should complete Step 3 on their **Investigation 4-4: Epi Log Worksheets** by listing the measures the entire class thinks should be taken to reduce the level of risk posed to the *population* by carrying heavy backpacks at school.

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## Risk Management Strategies

### Epi Assignment

Read article about other's proposed risk management strategies.

Highlight all steps that you think should be added to the class risk management strategy.

Due: Next Class

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Give each Epi Team a different article describing other people's proposed backpack-related strategies and policies.

Instruct students to complete the Epi Assignment for the next class by

- reading the article that was given to their Epi Team,
- highlighting all steps they think should be added to their risk management strategy.

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## Risk Management Strategies

Investigation  
4-4, Part 1,  
has ended.



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

In Part 2 of **Investigation 4-4: Risk Management Strategies**, students will continue to develop and refine their societal risk management strategy, critique their strategies in terms of considerations for judging the acceptability of a risk, and propose their strategy to appropriate stakeholders.

This concludes Part 1 of **Investigation 4-4: Risk Management Strategies** and students can now put away their **Epi Logs**.

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## Risk Management Strategies



## Risk Management Strategies

### Part 2

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

As already noted, **Investigation 4-4: Risk Management Strategies** is divided into two parts and takes two class periods to complete.

In Part 1, students developed a personal and societal risk management strategy to reduce the level of risk posed by carrying heavy backpacks.

In Part 2, they will continue to develop and refine their societal risk management strategy, critique their strategies in terms of their considerations for judging the acceptability of a risk, and communicate their strategy to appropriate stakeholders.

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## Risk Management Strategies



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Ask a student from one Epi Team to summarize the article that his or her Epi Team read for Part 2 of this investigation.

Have the student identify steps mentioned in the article that he or she thought should be added to the class risk management strategy.

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**Epi Log Worksheet**

3. Class strategy to reduce the level of risk posed by carrying heavy backpacks to the population.

a.

b.

c.

d.

e.

4.

**Detectives in the Classroom – Investigation 4-4: Risk Management Strategies**

Students should take out their **Investigation 4-4: Epi Log Worksheets** and turn to their responses to Step 3, completed during the previous class.

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## Consensus



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Lead a class discussion on the step(s) that the student thought should be added to the class risk management strategy.

Ask students to reach a consensus on whether or not the step(s) should be included in the class risk management strategy.

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## Epi Log Worksheet

4

3. Class strategy to reduce the level of risk posed by carrying heavy backpacks to the population.

a.

b.

c.

d.

e.

4.

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

If the consensus is that one or more steps should be added to the class risk management strategy, students should complete Step 4 by adding the steps on their **Investigation 4-4: Epi Log Worksheets**.

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## Consensus



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Ask another student from a different Epi Team to summarize the article that he or she read for homework.

Have the student identify steps mentioned in the article that he or she thought should be added to the class risk management strategy.

Lead a class discussion on the step(s) that the student thought should be added to the class risk management strategy.

Ask students to reach a consensus on whether or not these steps should be included in the class risk management strategy.

If the consensus is that one or more steps should be added to the class risk management strategy, students should complete Step 4 by adding the steps on their **Investigation 4-4: Epi Log Worksheets**.

Continue the above process until all articles have been summarized, suggested steps have been critiqued, consensus has been reached, and, as appropriate, the class risk management strategy has been revised.

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## Acceptable Risk Considerations

|   |   |
|---|---|
| Detectives in the Classroom <span style="float: right;">Name: _____</span>                  |   |
| Investigation 4-2: Epi Log Worksheet 2 <span style="float: right;">Date: ___/___/___</span> |   |
| <b>Acceptable Risk Considerations</b>   |   |
| <b>Reasons Risks Are Acceptable</b>   | <b>Reasons Risks Are Not Acceptable</b> |
| 1. Only affects person taking the risk  | 1. Also affects others                  |
| 2. Harm does not happen immediately   | 2. Harm is very serious                 |
| 3. XXXXXXXXXXXXXXXXXXXX   | 3. XXXXXXXXXXXXXXXXXXXX                 |
| 4. XXXXXXXXXXXXXXXXXXXX   | 4. XXXXXXXXXXXXXXXXXXXX                 |
| 5. XXXXXXXXXXXXX  | 5. XXXXXXXXXXXXXXXXXXXX                 |
| 6. XXXXXXXXXXXXXXXXXXXX   | 6. XXXXXXXXXXXXX                        |
| 7. XXXXXXXXXXXXX  | 7. XXXXXXXXXXXXXXXXXXXX                 |
| 8. XXXXXXXXXXXXXXXXXXXX   | 8. XXXXXXXXXXXXXXXXXXXX                 |
| 9. XXXXXXXXXXXXX  | 9. XXXXXXXXXXXXXXXXXXXX                 |
| 10. XXXXXXXXXXXXXXXXXXXX  | 10. XXXXXXXXXXXXX                       |
| 11. XXXXXXXXXXXXXXXXXXXX  | 11. XXXXXXXXXXXXXXXXXXXX                |
| 12. XXXXXXXXXXXXX   | 12. XXXXXXXXXXXXXXXXXXXX                |

### Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Students should now take out **Investigation 4-2: Epi Log Worksheet 2**.

Ask students:

- Can you critique your class risk management strategy in terms of the acceptable risk considerations you developed?

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## Acceptable Risk Considerations

1. Is the risk assumed voluntarily or involuntarily?
2. Are there less risky alternatives?
3. Is the risk from something that occurs naturally or is it from something that is man-made?
4. Is the risk known with certainty or are we unsure that there is a risk?
5. Is the risk catastrophic or is it similar to those we assume everyday?
6. Is the risk posed by something that is likely to be used as intended or is it likely to be misused?
7. Is the risk assumed at work or outside the workplace?
8. Is the risk distributed fairly or unfairly?

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Ask students:

- Does your risk management strategy address the following acceptable risk considerations?
  - Is the risk assumed voluntarily or involuntarily?
  - Are there less risky alternatives?
  - Is the risk from something that occurs naturally or is it from something that is man-made?
  - Is the risk known with certainty or are we unsure that there is a risk?
  - Is the risk catastrophic or is it similar to those we assume everyday?
  - Is the risk posed by something that is likely to be used as intended or is it likely to be misused?
  - Is the risk assumed at work or outside the workplace?
  - Is the risk distributed fairly or unfairly?

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## Epi Teams



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Divide the class into Epi Teams of four or five students per team.

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**Review**

**Epi Talk**

| Stakeholder   |
|---|
| Someone who represents a group of people and their interests. |
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|   |

**Detectives in the Classroom – Investigation 4-4: Risk Management Strategies**

Review the definition of “Stakeholder.”

Ask students:

- Can you identify people who would be interested in your risk management strategy?
- How could you make these stakeholders aware of your strategy?

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## Stakeholders



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

Ask each Epi Team to communicate with one of the following stakeholders by

- writing a letter to the school principal,
- writing a letter to the local newspaper,
- writing an article for the school newspaper,
- preparing a flyer to distribute to other students,
- preparing a presentation for their school's next PTA meeting.

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## Action

**All scientific work is incomplete –  
whether it be observational or experimental.  
All scientific work is liable to be upset  
or modified by advancing knowledge.**

**That does not confer upon us a freedom  
to ignore the knowledge we already have,  
or postpone the action that it appears to demand  
at a given time.**

Sir Bradford Hill,  
“The Environment and Disease: Association or Causation?”  
Proceedings of the Royal Society of Medicine, 1965

Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

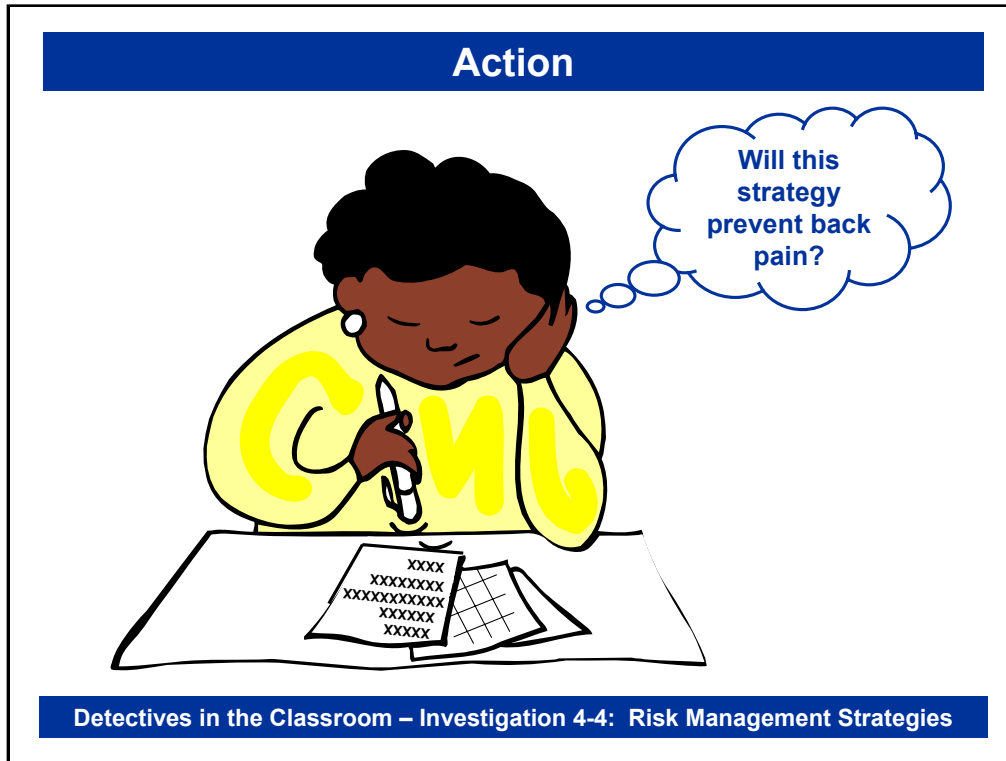
Read aloud this quote from the epidemiologist Sir Bradford Hill.

Ask students:

- Do you agree with Hill? Should action (a risk management strategy) be taken when we are not 100% certain that an association is causal?

Discuss.

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Ask students:

- Do you think your strategy will prevent back pain?
  - How will you know whether or not your strategy works?
- ☀ Teacher Alert: The investigations in Module 5 will teach students how the science of epidemiology can be used to evaluate prevention strategies.

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## Risk Management Strategies

Investigation  
4-4 has ended.



Detectives in the Classroom – Investigation 4-4: Risk Management Strategies

This concludes **Investigation 4-4: Risk Management Strategies** and students can now put away their **Epi Logs**.