

# Unit 13

## Genetically Modified Organisms

### Description

While genetic modification of organisms has been going on for millennia, we now have the tools to be able to insert intentionally selected genes from one organism into germ cells of unrelated species. Such genetically transformed organisms are increasingly common in agriculture, industry, and medicine. Their potential benefits and risks are explored.

### Menu of Unit Activities

**Note:** All activities, handouts, solutions, and tips can be found in the Appendix of this guide.

**Activity 1: Coming Attractions** (15 minutes + 30 minutes of video)

A series of quick questions about genetically modified organisms, whose answers are found in the video.

**Activity 2: What's the Difference?** (50 minutes)

Brief, team-led discussions on related terms in genetic engineering and cloning.

**Activity 3: Troubleshooter** (50 minutes)

Pairs read about failed genetic engineering experiments, find the flaws, and think of tests that would determine what went wrong.

**Activity 4: Two Thumbs Up?** (5 minutes)

Group discussion on how to interpret and apply the unit information.

# Before the Session

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**Facilitator:** Copy and assemble the following activity materials. (See the Activities section in the Appendix of this guide for master copies of transparencies and handouts, plus Tips and Suggested Answers.)

**Activity 1: Coming Attractions** requires:

- Transparency of the Coming Attractions Questions (master copy provided)
- Transparency of the Coming Attractions Answers (master copy provided)

**Activity 2: What's the Difference?** requires:

- One copy of What's the Difference? Questions per person (master copy provided)
- Transparency of What's the Difference? Questions (master copy provided)
- Tips and Suggested Answers
- One copy of the Genetically Modified Organisms online text chapter per two people (available online at <http://www.learner.org/channel/courses/biology>)

**Activity 3: Troubleshooter** requires:

- One copy of each of The Genetic Engineering Experiment Cases (master copy provided)
- Tips and Suggested Answers
- One copy of the Genetically Modified Organisms online text chapter per two people (available online at <http://www.learner.org/channel/courses/biology>)

**Activity 4: Two Thumbs Up?** requires:

- One copy of the Discussion Questions per person (master copy provided)

**Facilitator:** Make sure that the room has these supplies:

- pens or pencils and paper
- VCR and TV
- overhead projector and markers
- black/white board with chalk or markers

# Session Activities and Video

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## Activity 1a: Coming Attractions—Pre-Video Discussion (10 minutes)

- Read the Setup.
- Put the transparency of the Coming Attractions Questions on the overhead. Answer the questions individually, looking at them one by one and spending 30 seconds to one minute on each.

**Facilitator:** Stress that correct answers are not expected. This is just to get people thinking about the topics in the video.

- Variation: Instead of each person answering each question, do the activity as a group, with the session facilitator writing down consensus answers or guesses on a blackboard or transparency.

## Video (30 minutes)

- Watch the Genetically Modified Organisms video.

**Facilitator:** If possible, leave the transparency of Coming Attractions Questions up during the video.

## Activity 1b: Coming Attractions—Post-Video Discussion (5 minutes)

- After the video, put the transparency of the Coming Attractions Answers on the overhead.
- Go over the questions as a group, with the answers from the video.

## Activity 2: What's the Difference? (50 minutes)

- Arrange into pairs.
- Read the Setup.
- Have each person take a handout of the What's the Difference? Questions.
- Have each pair take at least one of the questions to work on, and one copy of the Genetically Modified Organisms online text chapter for reference.
- Spend five to 10 minutes preparing answers.
- Put the transparency of the questions on the overhead projector. As a group, read each question, waiting a few seconds to think of individual answers.
- Spend 3 minutes per question listening to the answer the assigned pair came up with, adding details and discussing similarities between the terms.
- See the Tips and Suggested Answers.

# Session Activities and Video, cont'd.

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## Activity 3: Troubleshooter (50 minutes)

- Arrange the group into a total of five teams, if possible. Otherwise, form pairs.
- Read the Setup.
- Distribute the pieces of paper with the cases so each team has one case.
- Each team will spend 5–10 minutes going through the case, then exchange cases with another team. Repeat until each team has discussed all five cases.
- As a group, discuss each case briefly, including the experiment ideas generated by the teams.
- See the Tips and Suggested Answers.

## Activity 4: Two Thumbs Up? (5 minutes)

- Read the Setup.
- Have each person take a copy of the Discussion Questions.
- Discuss the discussion questions in pairs or as a group.

## Summary (5 minutes)

- If time permits, as a group or in pairs, define the major ideas or “take home” lessons of this unit and its applications.