

## Teacher Guide: What Do You Know About Stem Cells?

### ACTIVITY OVERVIEW

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**Abstract:**

This pre-assessment activity, designed for use as an introduction to a module on stem cells, is intended to: (1) stimulate student thinking about stem cells; (2) evaluate students' prior knowledge of the topic; and (3) engage students in assessing community knowledge and perceptions. The activity will also help teachers identify misconceptions about stem cells.

**Module:**

Stem Cells in the Spotlight

**Key Concepts:**

Stem cells

**Prior Knowledge Needed:**

None

**Materials:**

Student handouts

**Appropriate For:**

Ages: 12 - 18

USA grades: 7 - 12

**Prep Time:**

10 minutes

**Class Time:**

10 - 20 minutes

**Activity Overview Web Address:**

<http://gslc.genetics.utah.edu/teachers/tindex/overview.cfm?id=SCRknow>

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Other activities in the *Stem Cells in the Spotlight* module can be found at:

<http://gslc.genetics.utah.edu/teachers/tindex/>

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### I. PEDAGOGY

#### A. Learning Objectives

- Students will review their current understanding of stem cells and issues related to stem cell research.
- Students will discuss ideas about stem cells with others.
- Students will begin to identify common misconceptions about stem cells and issues related to stem cell research.

#### B. Teaching Strategies

##### 1. *Timeline*

- 3-5 days before activity:
  - Present the assignment to students.
- Day of activity:
  - Facilitate a 10-20 minute discussion about the responses students gathered.

##### 2. *Classroom Implementation*

- Have students complete the “What Do You Know About Stem Cells” Interview Form student handout (S-2) at the beginning of their exploration of this topic. It is best to do this before any discussion so that students’ answers reflect their prior knowledge base.
- After students complete the handout, hold a classroom discussion in which students identify areas for further exploration. If misconceptions are stated as part of the “What Do You Know?” sections, guide students to include these topics with those they identify for further research.

##### 3. *Extensions*

- This activity could be expanded into a larger survey.
- Follow up this activity with those that explore the biology of stem cells and issues surrounding stem cell research.

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### II. MATERIALS

#### A. Detailed Materials List

- Activity instructions (S-1)
- Interview Form (S-2)

### III. STANDARDS

#### A. U.S. National Science Education Standards

##### Grades 5-8:

- Content Standard E: Science and Technology - Understandings About Science and Technology; technologies cost, carry risks, and provide benefits
- Content Standard F: Science in Personal and Social Perspectives - Science and Technology in Society; societal challenges often inspire questions for scientific research and societal priorities often influence research priorities; ethics

##### Grades 9-12:

- Content Standard E: Science and Technology - Understandings About Science and Technology; science often advances with the introduction of new technologies; new technologies often extend the current levels of scientific understanding and introduce new areas of research
- Content Standard F: Science in Personal and Social Perspectives - Science and Technology in Local, National and Global Challenges; we must decide how to use the knowledge available from science and technology; the basic concepts and principles of science and technology should be understood before debating the policies and ethics of science and technology-related challenges; individuals and society must decide on proposals involving new research and the introduction of new technologies into society

#### B. AAAS Benchmarks for Science Literacy

##### Grades 6-8:

- The Nature of Technology: Issues in Technology - rarely are technology issues simple and one-sided
- Human Society: Social Trade-Offs - making choices, personal versus social benefits

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### Grades 9-12:

- The Nature of Technology: Issues in Technology - alternatives, risks, costs and benefits
- The Human Organism: Human Development - social, moral, ethical and legal issues connected with the development and use of technology
- Human Society: Social Trade-Offs - benefits and costs of proposed choices
- The Designed World: Health Technology - social and ethical issues arising from biotechnology

### **C. Utah Core Curriculum**

#### Intended Learning Outcomes for the Utah Secondary Core Curriculum in Science:

Students will:

4. Demonstrate awareness of the social aspects of science.
  - g. Accept responsibility for actively helping to resolve social and ethical problems related to science and technology.
  - h. Acknowledge that policy issues cannot be resolved by science alone because value issues must also be considered.
6. Communicate effectively using science language and reasoning.
  - b. Prepare written and oral reports describing the reasoning which led to the conclusions.

#### Seventh Grade Integrated Science:

- Standard 4: Students will understand reproduction and heredity of organisms.  
Objective 3: Analyze issues related to genetics.
  - Cite advantages and disadvantages of genetic technologies.
  - Identify and explain issues related to genetic control of specific traits.

#### Biology (9-12):

- Standard 4: Students will evaluate the significance and impact of genetic alteration on living organisms.  
Objective 3: Research and analyze perspectives on issues related to genetic technologies.
  - Evaluate applications of genetic technologies.
  - Evaluate a position concerning a genetic technology.  
Objective 3: Describe the significance and impact of genetic alteration on living things.
  - Describe applications of genetic technologies.
  - Evaluate a position concerning a genetic technology.

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### Biology: Human Biology (9-12)

- Standard 3: Students will analyze how genetic information is passed from one cell to another.  
Objective 3: Describe the significance and impact of genetic alteration on living things.
  - Describe applications of genetic technologies.
  - Evaluate a position concerning a genetic technology.

## IV. CREDITS

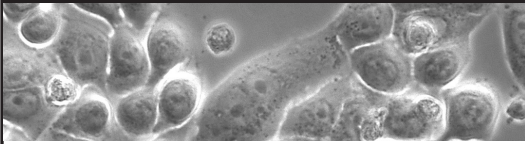
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## What do you know about stem cells?



Issues surrounding stem cell research have taken a prominent place in the public eye. What do you know about stem cells? What do your friends, family or teachers know? When you hear people discussing stem cell research, do you understand what they are talking about?

In the boxes on the **Interview Form**, write down what you and the people you talk with know about stem cells. Do you have questions about the topic? If so, record those as well.

Not sure where to start? Here are some sample questions to ponder. It's OK if you don't already know the answers – just give them a try.

- What is a stem cell?
- What are some different types of stem cells?
- What is the purpose of stem cell research?
- What are some ways that stem cells have been successfully used in medicine?
- What are some of the issues in stem cell research?
- What are some of the misconceptions that people have about stem cell research?

## Interview Form: What do you know about stem cells?

**Instructions:** In the boxes below, write down what you and the people you talk with know about stem cells. Do you have questions about the topic? If so, record those as well.

What do you know?

What does a parent know?

Any questions?

Any questions?

What does a friend know?

What does a teacher know? (Not your science teacher)

Any questions?

Any questions?