

Reproductive Technologies

5E Lesson

The 5E model is a scientifically proven method to improve student engagement and learning in your classroom

- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate



Complete Teacher Instructions

Reproductive Technologies 5E Lesson

Grades 9-12	Reproductive Technologies	Ongoing
Lesson Objective: Students will learn about: - Artificial Selection - Hybridization - Artificial Pollination - Artificial Insemination - In Vitro Fertilization - Cloning - Recombinant DNA - Ethics - Applications		
Possible Student Misconceptions: - Scientists are cloning people - Infertility can be cured - Cloning is an efficient means of reproduction - Reproductive technologies are only used for humans - There is no way to obtain stem cells without creating an embryo - Reproductive technologies are new		
Materials: 1 device (smartphone, Chromebook, laptop, tablet, or computer) - A means of projecting a PowerPoint presentation - Internet access - General classroom objects		
Teacher Notes: - All videos can be accessed directly from the PowerPoint. To retrieve icon while in slideshow mode and it will automatically open for you. reason, right-click on the image and click Edit Hyperlink or something similar. I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ - I don't believe in long lessons. If you feel your students are losing focus, Stop the PowerPoint and give them a 5-minute break. If you'd like, I recommend my video collection here - http://www.teachwithfergy.com - There are tons of brain-break videos to choose from all grouped		

Reproductive Technologies – 5E Lesson

Engagement Phase Your students will watch the video 'Move Over, Dolly: Scientists Clone Two Monkeys' and complete the questions found in the file – <i>Engagement – Monkey Cloning Video</i> . Teacher Notes: - The video is about two and a half minutes long. - You may need to pause a few times so students can write down their answers.	Duration: 2 min Teacher Role: learning and understanding ☐ Connect students' experiences ☐ Create interest ☐ Ask questions ☐ Understand objectives
Exploration Phase Exploration – Lab Station Activity - In groups of 2-3, have your students complete <i>Exploration – Lab Station Activity</i>. Once they're done, they will submit their passport to you. Teacher Notes: - The complete instructions for my Lab Station activity can be found in the <i>START HERE – Instructions</i> file.	Duration: 1 min Teacher Role: learning and understanding ☐ Students' experiences ☐ Students develop critical thinking skills ☐ Students observe results, analyze connections
Explanation Phase PowerPoint Lesson - The lesson is found in the folder – <i>Explanation – Lesson</i> - This lesson is designed to be completed over two days - There are multiple embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson - The lesson covers the following topics: - Reproductive Technologies - Artificial Selection - Hybridization - Artificial Pollination - Artificial Insemination - In Vitro Fertilization - Cloning - Recombinant DNA - Concerns Teacher Notes: - All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click the image and select Edit Hyperlink or something similar. - I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ	Duration: 2 min Teacher Role: concepts by material four presentation ☐ Students understand content ☐ Observations experience discussed ☐ Students vocabulary ☐ Students connect to presented experience

- I have also enclosed a .PDF version of both the teacher and student versions.
- I have created two versions of the lesson: one for upper middle school to high school students, and a simpler version for middle schoolers or older students with lower developed learning levels. Choose the version you think best fits your students.

Elaborate Phase

Elaborate – Scavenger Hunt

Your students will complete – *Elaborate – Scavenger Hunt*. This activity will require your students to move beyond what was covered directly in the lesson and allow them to further develop their understanding.

Teacher Notes:

- Students will work individually or in small groups
- Students will need one device per group

Evaluate Phase

Quiz

Have your students complete – *Evaluate – Reproductive Technologies Quiz*

Teacher Notes:

- It's sometimes best to have the students peer evaluate
- Placing students in small groups and having them exchange papers to mark will accomplish two things
 - Provide immediate feedback on the questions they just completed
 - Significantly reduce your marking time
- Peer evaluation is not needed, only suggested when appropriate

Duration: 1 hour

Teacher Role – Facilitate learning and keep students focused

Goal

- Students use their newly obtained knowledge to propose solutions and extend their learning to new situations

Duration: 30 min

Teacher Role – Distribute and collect evaluation

Goal

- Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

A Complete Lesson



Artificial Selection

- Choosing individuals with specific traits to reproduce
- **Differs from natural selection, the process that drives evolution**
- Also called selective breeding



← **Make sure your students are on track**

Student copies with blanks
Videos embedded right into your slideshow



Artificial Selection

- Choosing individuals with specific traits to reproduce
- _____
- Also called selective breeding



Interactive and Engaging Activities

Device-Based Scavenger Hunt Reproductive Technologies



Includes

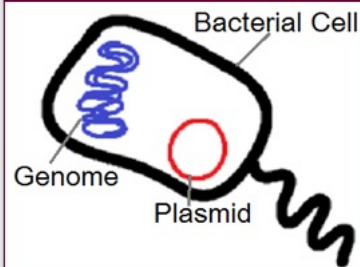
- 5 Unique Locations
- Online form submission
- Answer Key

Works on all smartphones, tablets, Chromebooks, and laptops

- **100% Digital**
- Simulations
- Quizzes
- Videos
- Games
- and more



Reproductive Technologies Lab Station Activity



7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

