

Skills developed:

Spelling, teamwork, creativity, composition, public speaking, knowledge of stem cells.

Dental Stem Cells

Background for the teacher: This unit is about dental stem cells. You've probably heard about stem cells in the news, and heard about potential uses of stem cells to treat diseases or heal injuries. You may not know that each of us had or has stem cells in our baby teeth or wisdom teeth. Scientists at the National Institutes of Health discovered stem cells in baby teeth in 2000. Since then dental stem cells have been shown to be potent stem cells that may lead to important health and dental breakthroughs in the coming years. Dental stem cells are non-controversial adult stem cells, not embryonic stem cells.

Store-A-Tooth is a new service available to parents who wish to save the dental stem cells from their child's baby teeth or wisdom teeth. You can read more at www.store-a-tooth.com.

Stem Cell Summary for Students

Our bodies are made of cells. Cells are very small. Between 10 and 100 cells can fit in the width of a single hair. Cells are a basic building block of life. Most cells have one or two jobs, like building bones or muscles. By working as a team, many different cells help our bodies do all the wonderful things we can do, like brush our teeth. "Stem cells" are special cells. Stem cells can renew themselves and turn into many different types of cells. Stem cells help rebuild and repair our bodies.

Scientists and doctors are studying stem cells for medical uses to treat injuries or diseases. One question scientists and doctors have is "What is a good source of stem cells?" In 2000, scientists at the National Institutes of Health discovered stem cells inside teeth. Scientists are studying what we can do with the stem cells from teeth. Now everyone can save their very own stem cells when their baby teeth come out, in case they need them later.

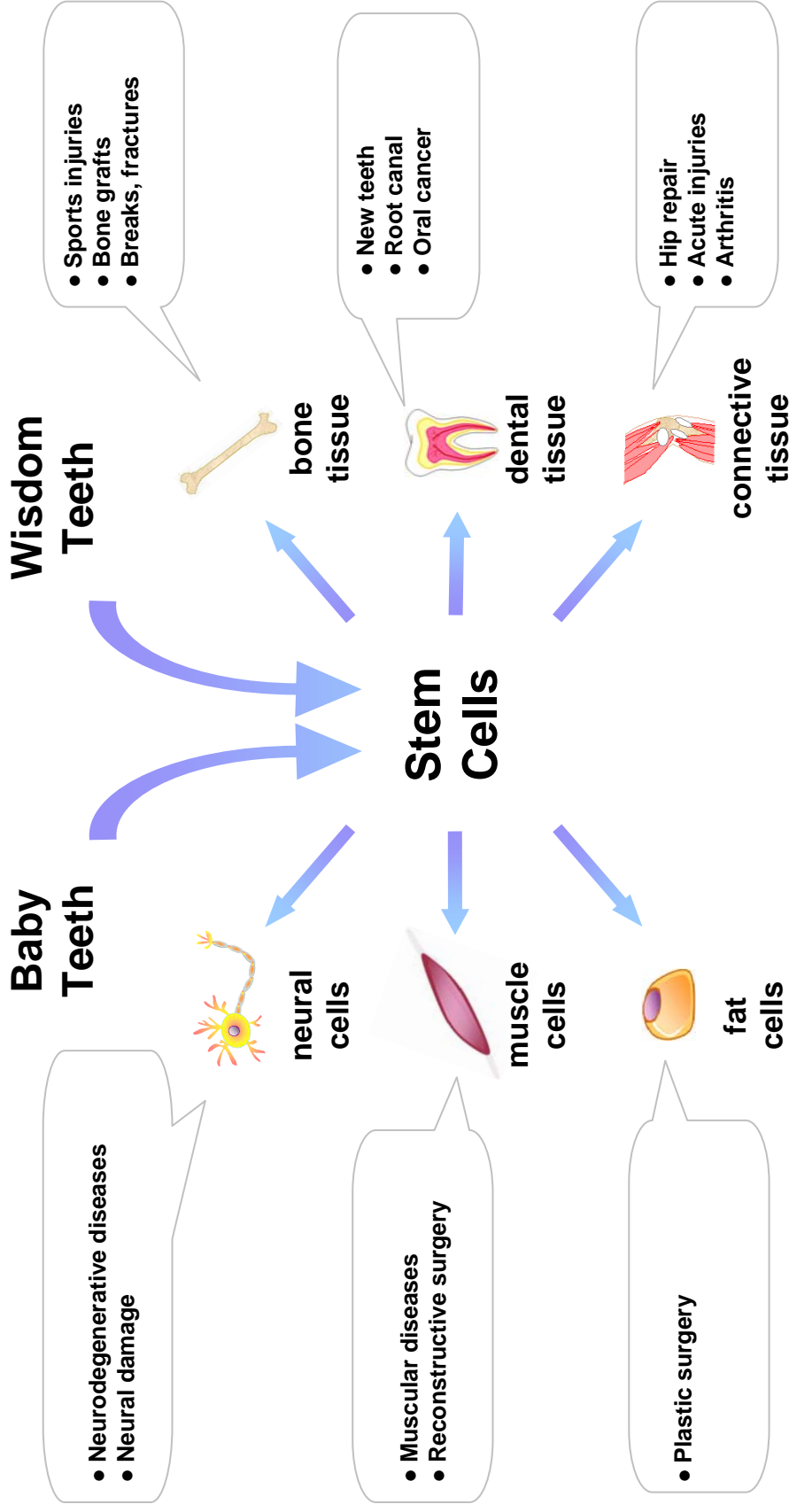
Stem Cell Game Instructions

1. Review the stem cell summary above with your students. Time permitting; explore more on the internet about cells and stem cells. Challenge question: is a chicken egg a cell?
2. Hand out the sheet "What can my cells do?" to each student.
3. Have each student pretend they are a powerful stem cell. Their first assignment is to choose what type of cell they will become (for example bone, neurons, muscle, teeth etc.). Have each student pick one of these cell types by circling it, without telling their friends.
4. Students that picked the same cell types get into groups, and brainstorm for a few minutes how these tissues function in the body, and make their list on the sheet. They can be simple like, "Bones help me stand up" or "teeth help me eat" to complex like "to run I need bones, muscles, and neurons." The "answer sheet" contains some possible uses for dental stem cells to help get you thinking.
5. On the board, the teacher makes a table with the cell type categories and students or the teacher fill in their answers from step 4 with input from each group.
6. Explain how these various tissues work together as systems. For example (bone + muscle helps you run, teeth + bone + muscle helps eat (or class can be asked using Socratic methods) to get them thinking about these cell types as systems. For more advanced classes, at the end you can ask them where they would classify some of the answers from the answer sheet.
7. Optional extra credit group project or individual take-home project: Students play the role of a stem cell scientist, doctor, or company president. Each writes (a paragraph or a page) about an invention or cure that uses dental stem cells to treat diseases or injuries. Optional: have them read their idea to the class.
8. Award the "Stem Cell Expert" certificates as you see fit.
9. Do you want to see your project online at www.store-a-tooth.com? If you want us to consider your project, email or fax to projects@store-a-tooth.com or 1-877-867-8753. Please include the author's first name, city, state, and age, and let us know if they will let us put it online at our site.

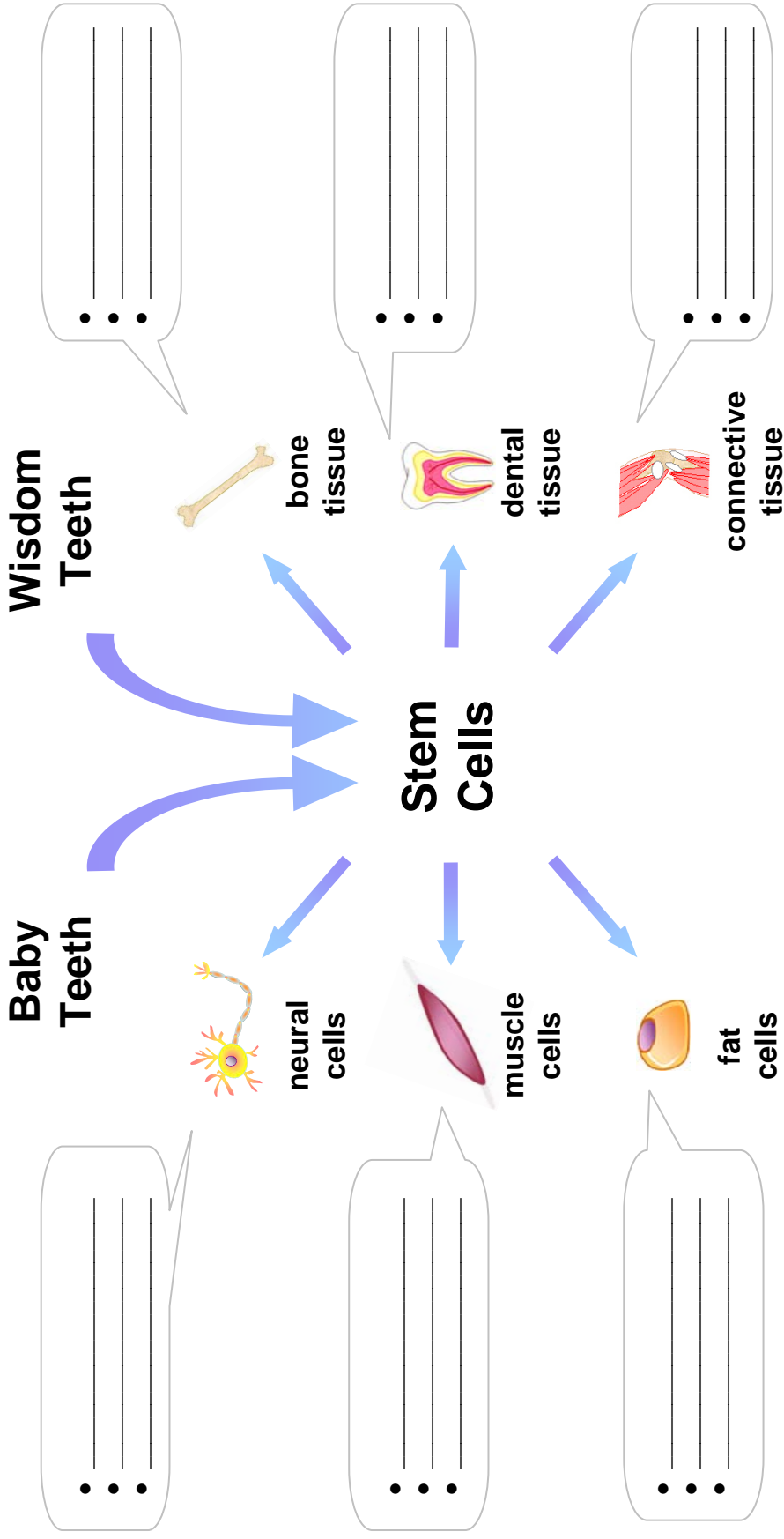
Stem Cell Coloring Sheet and Fill in the Blanks

For younger students, they can color the page, fill in blanks, and pick their favorite cells.

Example answers for game.



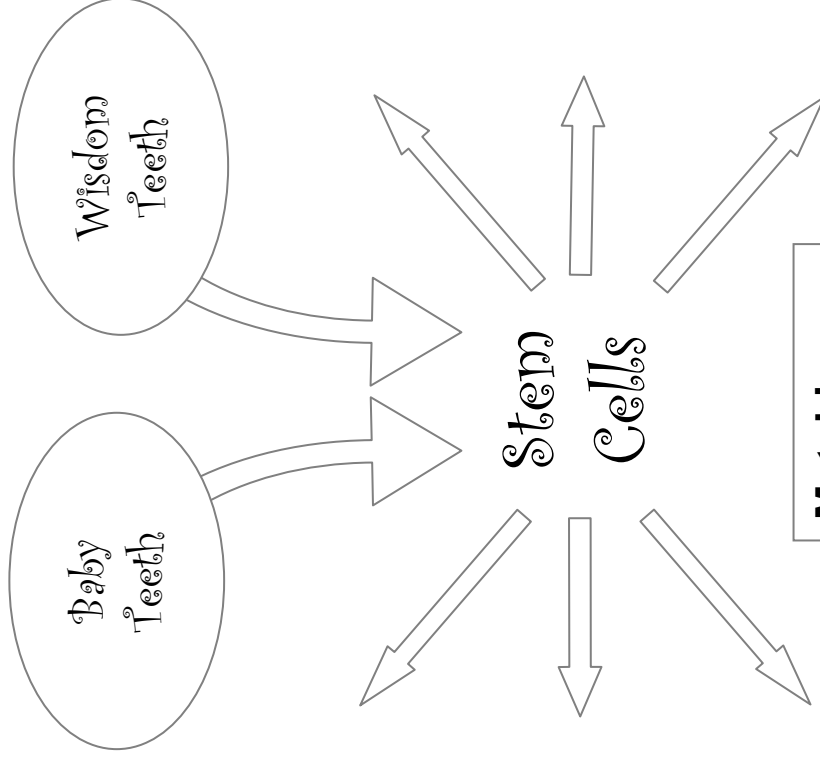
What can my cells do?



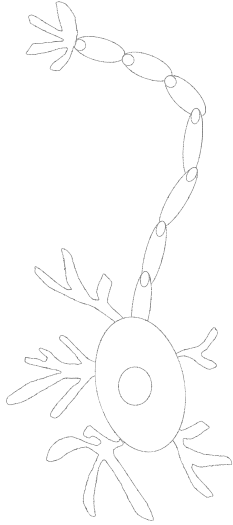
Stem cells from teeth may be useful to treat diseases in the future.

Pick your favorite.

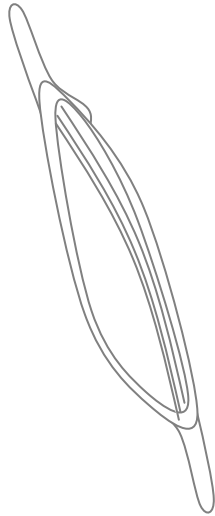
Coloring sheet and
fill in the blanks.



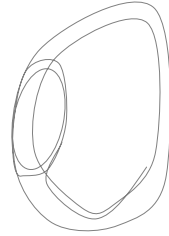
Matching:
Neuron
Muscle
Tooth
Bone
Fat
Joints



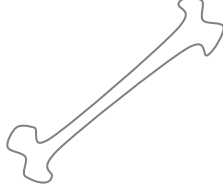
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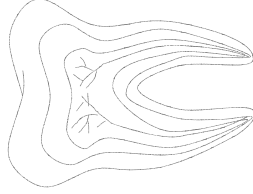
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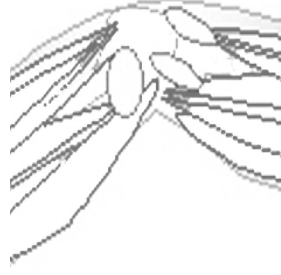
F _ _



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Stem Cell Expert

This certifies that

is a stem cell expert.

Date: _____

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