

Stem Cell Activity

You and your partner should have:

- Zip loc bag with color chips

- 3 colored pencils

- Worksheets (3)

Color of chips represents a specific protein or chemical that directs the differentiation of a stem cell

Directions

1. You and your partner will share the zip-loc bag of chips, but you will each draw your own chips and follow your own cell path on the flow chart.
2. Take turns drawing one chip from the bag. Person on left draws first. When drawing a chip, look away!
3. Use the keys on the next slides to determine what path your stem cell takes. We'll do this step-by-step.
4. Put the chip back in the zip-loc bag before your partner draws!!!
5. Keep drawing until you get to the end of the line!
6. If you draw "no change" draw again.

Differentiation Keys

Key 1 (path 1)

Differentiation Key (color)	Stem Cell Type Produced
Blue	<p>Endoderm The innermost layer of cells in an embryo</p> <p>These cells develop into the linings of the digestive tract and most of the respiratory system</p>
Green	<p>Mesoderm The middle layer of cells in an embryo</p> <p>These cells develop into muscles and most of the circulatory, reproductive, and excretory organ systems</p>
Orange	<p>Ectoderm The outermost layer of cells in an embryo</p> <p>These cells develop into sense organs, nerves, and the outer layer of skin</p>

Key 2

Differentiation Factor (color)	Endoderm	Mesoderm	Ectoderm
Blue	no effect (draw again)	hematopoietic (blood forming) stem cell	skin precursor cell
Green	pancreas precursor cell	no effect (draw again)	no effect (draw again)
Orange	intestinal epithelial stem cell	muscle stem cell	neural stem cell

Key 3

DIFFERENTIATION COMPLETE

Color	Pancreas Precursor Cell	Intestinal Stem Cell	Muscle Stem Cell	Hematopoietic (blood-forming) Stem Cell	Skin Precursor Cell	Neural Stem Cell
Blue	no effect	no effect	heart muscle cell	macrophage	hair follicle cell	motor neuron
Green	alpha cell producing glucagon	intestinal epithelial cell	no effect	no effect	no effect	no effect
Orange	beta cell producing insulin	no effect	smooth muscle cell	red blood cell	cheek lining cell	photoreceptor