SCIENTIFIC AMERICAN FRONTIERS

TEACHING GUIDE

www.pbs.org/saf/1209

Body Building

Activity 4: Grades 5-8

FRONTIERS Pop-Quiz

Enter correct quizzes in the FRONTIERS T-shirt drawing see below!

STUDENT: _____

TEACHER: _____

1) Name three types of tissue being cultured by scientists.

2) What is special about embryonic stem cells?

a) They beat like heart cells.
b) They are flexible like plastic.
c) They will only divide once and then die.
d) They can become any other type of cell.

3) The liver is your largest organ. List three important liver functions.

4) Why would a liver chip be useful to scientists?

a) To test drugs for safety before using them in people.
b) To research diseases of the liver such as Hepatitis.
c) Both of the above.
d) Neither of the above.

5) Name three differences between Mike Dorsey's Heartmate and Bob Tools' Abiomed heart?

6) In what animal was the Abiomed heart tested extensively before the human trials began? Why?

7) Eric Bellamy was given a complex FES system that stimulated 20 muscles per leg in order for him to walk. In a healthy person, how many muscles are involved in walking?

a) 10 muscles per leg.
b) 20 muscles per leg.
c) 50 muscles per leg.
d) 100 muscles per leg.

8) How does Jim Jatich currently control the FES implants that allow his left hand to grip?

a) He shrugs his right shoulder.
b) He relies on a magnet and sensor in his wrist.
c) He presses a button.
d) He calls out a word.

NOTE: Quizzes with 100% correct answers can be entered by teachers only into our T-shirt drawing. FRONTIERS randomly selects 20 names after each program. Send all correct quizzes in one envelope, along with teacher's name, grade and course, school name and address, where the students watched the show (home or school), and the students' favorite segment. Mail to: FRONTIERS Quiz, Chedd-Angier Production Company, 70 Coolidge Hill Rd., Watertown, MA 02472.

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Answers

1) Cartilage, heart, retina, liver.

2) d

3) It detoxifies drugs. It makes almost all the proteins found in the blood. It synthesizes bile.

4) c

5) The Heartmate, which attaches to the heart's left ventricle, is intended only as a bridge to transplant while the Abiomed replaces the heart entirely. The Abiomed heart is self-contained within the body and does not require connections through the skin, as the Heartmate does. The Heartmate uses a deliberately roughened interior surface to help prevent blood clots, while the Abiomed heart aims to be completely smooth and seamless.

6) Calves, because they are about the same size as a human patient.

7) c

8) b