

## **Historical Lesson: Grade 6**

### **Rudolf Virchow and the Circulatory System**

#### **Objectives:**

Students will do an experiment which will represent a blood vessel with a clot. Students will research online Rudolf Virchow and report details about him including the significant impact he had on medicine and the circulatory system. Students will present the information they find about Rudolf Virchow and discuss it as a large group.

#### **Materials:**

- 2 small clear tubs that bend easily
- A glass of red water
- 1 empty glass
- Lard.
- Internet Access
  - Prepare in advance: Warm the lard so it is a liquid. Using one of the small clear tubs, bend the tub and run the lard to the center of the tub so it settles in the bend. Be sure it nearly fills the bend but not completely. Let the lard harden. The tub represents a blood vessel and the lard represents a blood clot.

#### **Vocabulary:**

Embolism  
Thromboembolism

#### **Engage**

Explain: We have been exploring the Circulatory System in previous lessons. (Show the students the empty tube. Hide the other tube with the “clot”.) Pretend this tube is a blood vessel. The red water is blood. We are going to pour the “blood” through the “vessel” into the other cup. (Pour the water through the tube. Drain it all into the other cup.)

Discuss: Have the students describe what happened. Ask: Did the “blood” go through the “blood vessel” easily? (yes)

Discuss: Have the students explain what a clot is or draw on the board what a clot looks like. Discuss as a class blood clots.

Now show the students the other tube that represents a vessel with a clot. Run the red water through the tube.

Discuss. What happened? How was this different than the other tube? (The “blood” moved much slower through the tube.) Ask: Why might this be a problem?

**Explore:**

Next have the students research Rudolf Virchow. Depending on the number of available computers, organize students in groups of 3. Have the students find answers to the following questions.

When was the Rudolf Virchow born?

Where did the Virchow live?

What was Virchow’s profession?

What are three of Virchow’s major findings?

What did Virchow do that relates to the experiment at the beginning of the lesson?

Assign students the task of researching Virchow in further detail. Pick one significant thing he did and write a one page paper about that particular thing. Also using a large sheet of paper or poster board have the students create a short presentation about their research. Have each group write one multiple choice question about their report. Have students turn in their question and answer.

**Explain:**

As a large group discuss the 5 specific questions. After discussing the 5 questions have each group present the additional researched information to other group members. Be sure students take notes on the presentations.

Answers:

Born: 1821

Born in: Schivelbein, Pomerania

Died in: Berlin in 1902

Profession: German Doctor, anthropologist, public health activist, pathologist, prehistorian, biologist, and politician

Significant Discoveries: Leukemia, best known for his law “every cell originates from another cell”, embolism

Relate it to the Experiment:

Explain:

Rudolf Virchow explained and made clear the term thromboembolism, causing the use of the term embolism. Have a student look up the definition of Thrombosis and another student look up the definition of embolism.

Discuss.

**Thrombosis** is the formation of a [clot](#) or [thrombus](#) inside a [blood vessel](#), obstructing the flow of [blood](#) through the [circulatory system](#). **Thromboembolism** is a general term describing both thrombosis and its main complication which is [embolisation](#).

In [medicine](#), an **embolism** occurs when an object (the **embolus**, plural **emboli**) migrates from one part of the [body](#) (through [circulation](#)) and cause(s) a blockage (occlusion) of a [blood vessel](#) in another part of the body.

This can be contrasted with a "[thrombus](#)" which is the formation of a [clot](#) within a blood vessel, rather than being carried from elsewhere. (The above definitions are taken directly from the following website: <http://en.wikipedia.org/wiki/Embolism> )

In other words Virchow made clear the term pulmonary thromboembolism and caused the use of the term embolism. Basically the difference between a thrombosis and embolism is that thrombosis is a clot formed at the site of a clot and embolism is a clot that occurs when an object comes from another part of the body.

**Expand:**

Create your own model that clearly shows an embolism. Pretend you are a doctor and you need to demonstrate to a patient what an embolism is. Discuss with the students what they think they will need to include in their model. In addition to creating a model have students write a short explanation of an embolism to the "patient". In other words they will need to pretend that they are showing a patient the model and explaining an embolism to them.

You may choose to assign this as homework or if it is done in class you will need to provide them with materials to build the models. (Materials might include: clay, play dough, string, yarn, cardboard, boxes, etc...)

<http://www.healthatoz.com/healthatoz/Atoz/common/standard/transform.jsp?requestURI=/healthatoz/Atoz/ency/embolism.jsp>

**Evaluate:**

Using the student's questions create a test about Virchow. Include in the test a question about thrombosis and embolisms.

Grade students on their model and explanation of an embolism from the expand portion of the lesson.