

Math Strand 5: Data and Probability

CLE: 5.4 Understand and apply basic concepts of probability.

Health Profession: Surgical Technician

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References:

<http://www.hillyardtech.com/departments.php?area=surgicaltech>.

Larson, R., Boswell, L., Kanold, T., Stiff, L. (2007). *Algebra 2* (3rd ed.). Evanston, Illinois: McDougal Littell.

Surgical Technologists. (2007, December 18). Retrieved February 2, 2008, from <http://www.bls.gov/oco/ocos106>.

Objectives:

At the completion of this presentation the high school student will be able to:

1. Explain how probability is used by Surgical Technicians.
2. Demonstrate how to figure a probability question.
3. Identify the importance of this information to a surgical tech.

Background Summary of Information as Related to Surgical Technicians and CLE:

Surgical technicians assist in surgical operations under the supervision of surgeons, registered nurses or other surgical personnel. Surgical techs are also called scrub techs. Their responsibilities include preparing the operating room by making sure all of the necessary sponges, sterile drapes, tools, and equipment are all readily available. Surgical techs are responsible for preparing the patient for surgery by washing, shaving, and disinfecting the incision sites. They transport patients and help to observe the patient during surgery. It is also part of their job to pass instruments and to keep track of all of the tools and equipment used during the surgery to protect against something being accidentally left in the patient.

Educational preparation includes these classes: Microbiology, Fundamentals, Medical Terminology, Pharmacology, Procedures, Clinical.

Surgical technicians are able to work in several different environments including hospital surgical departments, OB departments, outpatient surgery centers, cardiac cath labs, eye surgery centers, plastic and reconstructive surgery centers, and doctor's offices. At Hillyard Technical Center in St. Joseph, MO, the Surgical Technician program is an 11 month program with full time classes Monday through Thursday.

“Theoretical Probability of an Event: when all outcomes are equally likely, the theoretical probability that an event A will occur is $P(A) = \frac{\text{Number of outcomes in event A}}{\text{Total number of outcomes}}$ ” (Larson)

Scenario:

You are working as a surgical tech in an operating room. You know that one of your responsibilities, as a surgical technician, is to assist with counting sponges. The surgeon is ready to finish the surgery, but first needs to hear from you that all of the sponges are accounted for. You supplied the room with 150 objects: 40 sponges, 60 various metal instruments, 5 basins, and 45 other various tools. All of these

instruments were used during the surgery.

What is the probability of leaving 1 of the sponges in this patient?

1 out of 40

What is the probability of leaving 1 of the metal instrument in this patient?

1 out of 60

What is the probability of leaving 1 of any of these tools in the patient?

150 total tools. 1 out of 150.

Activities:

Coin Flip: Use a quarter. Have students divide in groups of two. Assign one student to heads and the other student to tails. Have them flip the coin 50 times and record how many times it lands on tails and how many times it lands on heads. Have them figure out what the probability of it landing on heads is. $P=1/2$

Have a mason jar of M&M's with a known number of 30 red, 56 blue, 50 green, 60 brown. Total: 196. Have the students figure out the probability of picking out a red M&M. Then have them figure out the probability of drawing either a green or brown M&M. You might even have the students fill out a chart with different combinations that could be drawn.

Such as if you drew 5, what's the probability of them all being red?

Answer:

$(30/196) \times (29/195) \times (28/194) \times (27/193) \times (26/192) = 6 \times 100 = .006\%$

Supplies Needed:

M&M's

Mason jar

Quarters: enough for every 2 students to have one.

Surgical Technicians and Probability Exercises.

SCENARIO:

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What is the probability of leaving 1 of the sponges in this patient?

What is the probability of leaving 1 of the metal instrument in this patient?

What is the probability of leaving 1 of any of these tools in the patient?

Coin Flip:

HEADS

TAILS

M&Ms:

Probability of drawing a red one:

Probability of drawing a blue one:

Probability of drawing 5 red ones:

Probability of drawing 2 green ones:

Educational Requirements and Overview of Program:

Hillyard Technical Center program of Surgical Technology is accredited by the Missouri Department of Elementary and Secondary Education and through CAAHEP. (Commission on Accreditation of Allied Health Education Programs)

Surgical Technologists are integral members of the surgical team that includes the Surgeon, Anesthesiologists, RN's and LPN's. This profession is one of the fastest growing careers in the next millennium.

Functions of the Surgical Technologist include, but are not limited to, creating and maintaining the sterile field, passing instruments and /or assisting the Surgeon, and participating in team care of surgical patients.

Hillyard Surgical Technology Program is an eleven month full time educational program. Classroom hours are 7:30 a.m. to 4:00 p.m. Monday through Thursday. Clinical experiences are held at Hospitals, surgery centers, OB units, cardiac cath labs, doctor offices, dental offices, eye clinics and plastic and reconstructive Surgery centers.

The formal curriculum follows the Association of Surgical Technologist core curriculum and includes specialty courses in the sciences, surgical technology and clinical components. The program includes instruction in the following areas:

- **Anatomy and Physiology**
- **Microbiology**
- **Fundamentals of surgical technology with lab**
- **Medical Terminology**
- **Pharmacology**
- **Procedures I,II**
- **Clinical I,II**

Career Opportunities after Graduation:

- Hospital Surgical Departments
- Outpatient Surgery Centers
- OB Departments
- Cardiac Cath Labs
- Eye Surgery Centers
- Plastic and Reconstructive Surgery Centers
- Doctors offices

Prerequisites:

Human Anatomy & Physiology (available at HTC) For 2007 class, Human Anatomy may be approved as a co requisite. Determination will be on an individual basis.

Taken from <http://www.hillyardtech.com/departments.php?area=surgicaltech>