

## Intake and Output

### Course

Health Science  
Technology I

### Unit

Skills  
Development

### Essential Question

How do health  
care skills  
promote health  
and prevent  
illness?

### TEKS

121.3 5A, 12B,  
13A

### TAKS

ELA 1, 3, 4  
Algebra I B3A,  
B4B  
Mathematics 1,  
2, 8, 9  
Science 2

### Prior Student Learning

The lesson on  
systems of  
measurement.

### Estimated time

3 Hours

### Rationale

Maintaining fluid balance is important in health and wellness.

### Objectives

Upon completion of this lesson, the student will be able to

- accurately measure and record intake and output.

### Engage

Have students do an online search on Jennifer Strange or show the news report on Jennifer Strange, a 28 year old who died of water intoxication after participating in a contest at a radio station to win a Wii. Have students discuss: How much water do we need a day? How much water is too much? Which organs help to regulate water balance in the body?  
[www.news10/net/display\\_story.aspx?storyid=23350](http://www.news10/net/display_story.aspx?storyid=23350)

### Key Points

- I. Fluid Balance: Fluid intake should equal fluid output
  - A. Intake
    1. 70% of adult body consists of water
    2. 1% short= thirsty  
5% short= slight shortage  
12% short= possible death
    3. Daily:  $\frac{1}{2}$  of body weight in ounces
  - B. Output
    1. Average urine output= 1500 cc's
    2. Water is also lost from:
      - a. Skin
        1. insensible: 200-400 cc's
        2. sensible: 300-500 cc's
      - b. Lungs: 400cc
      - c. Gastrointestinal tract : 100 cc's
- II. Fluid Imbalance
  - A. Dehydration
    1. Causes
      - a. Diarrhea
      - b. Vomiting
      - c. Bleeding
      - d. Excessive perspiration (diaphoresis)
      - e. Poor fluid intake
    2. Symptoms
      - a. Fever is present.

- b. There is a decrease in urine.
- c. Urine is concentrated.
- d. Weight loss occurs.
- e. Membranes are dry and it is difficult to swallow.
- f. Tongue is coated and thickened.
- g. Skin becomes hard and cracks and is dry and warm

B. Edema

1. Causes

- a. High salt intake
- b. Infections
- c. Injuries or burns
- d. Certain kidney diseases
- e. Certain heart diseases or heart inefficiencies
- f. Sitting too long in one position
- g. Infiltration of IV fluid

2. Symptoms

- a. Decrease in urine output
- b. Gain in weight
- c. Puffiness or swelling
- d. Sometimes shortness of breath

III. Intake and Output – chart any fluid taken in and any fluid that is eliminated. Record in cubic centimeters (cc).

To convert ounces to cubic centimeters:  
 $30 \times (\text{number of ounces}) = \text{number of cc}$

A. Intake

- 1. All liquid taken by mouth
- 2. Any food item that turns to liquid at room temperature (e.g., gelatin, inc cream, ice, etc.)
- 3. All fluid taken by IV or tube feeding

B. Output

- 1. Urine
- 2. Emesis (vomit)
- 3. Suctioned secretion
- 4. Drainage
- 5. Excessive perspiration

**Activity**

- I. Complete the Recording Intake and Output Practice.
- II. Complete the Intake and Output Skill Lab.

**Teacher Note**

*Set up a skill lab with client intake and output items. Use food coloring to make it more realistic. Give each student an **Intake and Output Record** and have them rotate to each client area to measure and record intake and output. See directions for setting up the lab.*

**Assessment**

Successful completion of Intake and Output Practice  
Successful completion of intake and Output Skill Lab

**Materials**

IV bag  
Bedpan  
Urinal  
Orange juice glass  
Milk carton  
Soup bowl  
Emesis basin  
Foley catheter bag  
Wall suction  
Hat for commode  
Food coloring

[www.utmb.edu/erc/facts/balancing%20fluids.pdf](http://www.utmb.edu/erc/facts/balancing%20fluids.pdf) (information on intake and output)

[http://www.stjude.org/SJFile/gen\\_info\\_intake\\_output.pdf](http://www.stjude.org/SJFile/gen_info_intake_output.pdf) (information on keeping an intake and output for children).

**Accommodations for Learning Differences**

For reinforcement, the student will record personal intake and output for 2 days. (Supply student with urine cup.)

For enrichment, the student will research a disease or disorder that affects fluid balance and predict how intake and output may be affected.

**National and State Education Standards**

National Health Science Cluster Standards

HLC 10.01 Health care workers will apply technical skills required for all career specialties. They will demonstrate skills and knowledge as appropriate.

**TEKS**

121.3 (c) 5A locate, evaluate, and interpret career options and employment information;

121.3 (c) 12B utilize appropriate equipment in the delivery of health care services; and

121.3 (c) 13A assess client status and accurately determine vital signs.

Texas College Readiness Standards

Mathematics

IV.B.1. Convert from 1 measurement system to another; and

IV.B.2. Convert within a single measuring system

Science

I. A. 1. Utilize skepticism, logic and professional ethics in science.

Cross-Disciplinary

I. C. 1. Analyze a situation to identify a problem to be solved.

I. C. 3. Collect evidence and data systematically and directly relate to solving a problem

## Directions for Setting Up the Lab

You do not need to have all of the equipment listed, You can usually get IV bags from your hospital or Nursing home. It is preferable to place water in the IV bags since most solutions contain dextrose and are very sticky after it dries if spilled. So, you can empty the solution and fill the bag with water. Each student should have an I&O sheet to record the information.

1. At one station hang the IV bag with solution missing. Have students figure out the amount left in the bag and subtract it from the total amount of solution to figure the IV intake.
2. At another station put brown liquid in a bed pan or it can also be "urine" and "urine" in a urinal. Urinals have measurement lines and can be measured directly in the container. Have students pour the "stool or urine" from the bedpan into a measuring container to see how many cc's are in each and record this in the correct column on the I&O sheet.
3. A foley catheter bag can be hung from a bedside or if you do not have a bed, hang it on a desk or chair. Have students use another measuring container ( a urinal can be used for this) and empty the catheter into the container. This amount also is charted. If using a yellow liquid have the students note the characteristics of the "urine": color, clarity, odor.
4. On a tray, if one is available, (I use ones from the school cafeteria) put a milk carton, soup bowl and orange juice glass. Either have the amount the patient consumed written out on a piece of paper on the tray or put liquids in each container and the students can measure it in a measuring container and subtract it from the total number of cc's that the container has. Milk cartons, soda cans, water bottles and almost any purchased container has the number of cc's on the container otherwise use the measurements listed on the I&O sheet.
5. The emesis basin can be measured the same way as the urinal and bed pan. Students pour the "emesis" into the measuring container. Some emesis basins have measurements on the inside of the basin. The student can use these lines.
6. Not many people have wall suction but if you do put a liquid, either mimicking stomach contents or it can be sputum looking, into the container. The students can use the measurement lines on the suction container to calculate output.

## Recording Intake and Output Practice

Mrs. Jane Black is a client who had a gastrectomy (removal of the stomach). A nasogastric tube is in place to drain all fluids. It is connected to suction and irrigated at times. Intake is limited to sips of Sprite and ice cubes.

**Instructions:** Chart the following information on an **I and O record**. Record all 8 hour and 24 hour totals.

1. **Water intake**

8AM 2 Tbsp  
2 PM 1 Tbsp  
5 PM 3 Tbsp  
12 MN 2 tsp  
2 AM 1 tsp

2. **Sprite**

7 AM 1 tsp  
8AM 1 water glass  
11AM ½ juice glass  
4PM 1 cup  
8PM 1 ounce  
12 MN 2 ounces  
2 AM 1 tsp

3. **Ice cubes** (Note: 1 cube = 5 cc)

1 ice cubes at 9AM, 12N, 3PM, 11PM, and 3AM

4. **IV**

7AM 500 cc  
2PM 450 cc  
6PM 500 cc  
10 PM 400 cc  
3 AM 400 cc  
6 AM 500 cc

5. **Emesis**

6PM 100 cc clear liquid  
9PM 130 cc reddish brown liquid  
2AM 200 cc golden green liquid

6. **Urine**  
11 AM 450 cc  
4PM 300cc  
8PM 250 cc  
11PM 300 cc  
3AM 200 cc  
6AM 300cc

7. **Brown liquid stool**  
10AM 750 cc  
2PM 200 cc  
6AM 200 cc

8. **NG suction**  
2PM 700 cc brown liquid  
10PM 650 cc brown liquid  
6AM 425 cc brown liquid

9. **NG irrigation**  
8AM 30 cc  
10AM 30 cc  
2PM 30 cc  
6PM 45 cc  
1AM 60 cc  
4 AM 25 cc

## Intake and Output Record

Measurements

Large glass 240cc  
Water glass 180cc  
Juice glass 100cc  
Small bowl 120cc

Coffee pot 240cc  
Cup 120cc  
Soup bowl 200cc  
Jello 120cc

Patient's Name \_\_\_\_\_

Time	Oral	IV	Irrigation	Remarks	BM	Emesis	Urine	Suction	Remarks
7AM									
8									
9									
10									
11									
12N									
1PM									
2									
3									
TOTAL				8 Hr Intake	TOTAL				8 Hr Output
4PM									
5									
6									
7									
8									
9									
10									
11									
TOTAL				8 Hr Intake					8 Hr Output
12MN									
1AM									
2									
3									
4									
5									
6AM									
TOTAL				8 Hr Intake					8 Hr Output
TOTALS				24 Hr Intake					24 Hr Output