# ACTIVITY 11-2
# CALCULATING TIME OF DEATH USING ALGOR MORTIS

## Objective:

*By the end of this activity, you will be able to:*
Estimate the time of death using algor mortis measurements.

## Materials:

paper
pen or pencil
calculator
Rigor Algor Reference Table

## Safety Precautions:

None

## Procedure:

Working in pairs, answer the following questions using this information:

- For the first 12 hours, the body loses 0.78°C (1.4°F) per hour.
- After the first 12 hours, the body loses about 0.39°C (0.7°F) per hour.

**Example 1:** What is the temperature loss for someone who has been dead for 12 hours?
Temperature loss = (0.78°C/hour) x 12 hours = 9.36°C

**Example 2:** Calculate the time of death if a person has been dead for less than 12 hours.
If temperature loss is less than 12 hours (or less than 9.36°C), then you use the rate of 0.78°C per hour to estimate the time of death.
Temperature of dead body is 32.2°C (90°F).
Normal body temperature is 37°C. (98.6°F)
37°C – 32.2°C = 4.8°C lost since death.
How long did it take to lose 4.8°C ?
0.78 (°C/hour) x (unknown number of hours) = degrees lost
0.78 (°C/hour) x (unknown number of hours) = 4.8°C lost by body
Solve for the unknown number of hours since death occurred:
Number of hours = 4.8°C ÷ 0.78 (°C/hour)
Number of hours = 6.1 hours
Convert 0.1 hours into minutes:
0.1 hour ( 60 (min/hour) = 6 minutes
Hours since death = 6.1 hours or 6 hours and 6 minutes

**Example 3:** Is the time of death more than 12 hours or less than 12 hours?
Recall that if a body has been dead 12 hours or less, the body loses heat at the rate of 78°C per hour. If the body has been dead 12 hours, then 78°C/hour x 12 hours = 9.36°C.

If a body loses 9.36°C, then the person has been dead for 12 hours.

If a body loses more than 9.36°C, then the person has been dead for more than 12 hours.

If they lose less than 9.36°C, then the body has been dead for less than 12 hours.

For each of the following, state if the body had been dead for more than or less than 12 hours based on the number of degrees lost:

1. total loss of 7.9°C
2. total loss of 4.4°C
3. total loss of 11.7°C
4. total loss of 17.2°C
5. total loss of 10.6°C

.78 · 11 = 8.58 hours

10.6 − 8.58 = 2.02

2.02 / .39 = 5.18

12 + 5.18

17.2 hours

**Example 4:** Calculate the time of death if the person was dead for more than 12 hours.

If the body has lost more than 9.36°C, then you know that the victim has been dead for more than 12 hours. Recall that after 12 hours, the body loses heat at a rate of 0.39°C per hour. You need to calculate how many hours beyond the 12 hours that someone died and add it to the 12 hours. Body temperature was given as 22.2°C (72°F).

1. How many total degrees were lost from the time of death until the body was found?

   37°C – 22.2°C = 14.8°C

2. Since 14.8°C is more than 9.36°C, you know that the body was dead longer than 12 hours. How much longer?

   37°C – 22.2°C = total loss of 14.8°C since death

   9.36°C were lost in the first 12 hours

   14.8°C lost since death – 9.36°C lost the first 12 hours =

   5.44°C lost after the first 12 hours

3. Recall that the rate of heat lost after 12 hours is 0.39°C per hour. You need to determine how many hours it took to lose that 5.44°C.

   (0.39°C/ hour) x (unknown # of hours) = degrees lost after 12 hours

   (0.39°C/hours) x (unknown # of hours) = 5.44°C lost after the initial 12 hours

   Solve for unknown number of hours:

   unknown # of hours (x) = 5.44°C ÷ (0.39°C/hour)

   = 14.8 hours total time to lose 14.8°C or approximate time of death

4. First 12 hours there was a loss of 9.36 degrees C 9.36°C
   Next 14.8 hours there was an additional loss of 5.44° C= 5.44°C
   Therefore, the victim has been dead about 26.8 hours. (or approximately 27 hours)

   .8 hours x 60 min/hr = 48 minutes