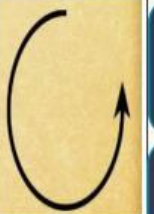
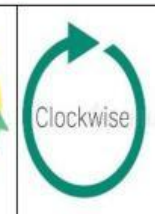
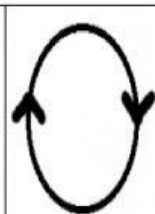
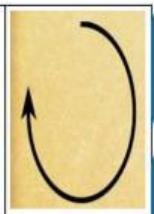


### Understanding Quarters: Clockwise and Counterclockwise:

**Concepts** of **clockwise** (moving in the direction of a clock's hands) and **counterclockwise** (moving in the opposite direction to a clock's hands) rotations.

### Clockwise, Counterclockwise, or Anti-clockwise Challenge!

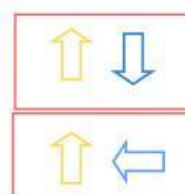
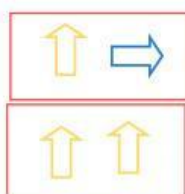
Drag and drop the correct answers under the pictures below, examine the images of rotating arrows (clockwise, counterclockwise, and anti-clockwise).

|                                                                                    |                                                                                    |                                                                                                        |                                                                                    |                                                                                                        |                                                                                     |                                                                                                                       |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|   |   | <br>Counter Clockwise |   | <br>CLOCKWISE         |   | <div>Clockwise</div> <div>Clockwise</div> <div>Clockwise</div>                                                        |
|  |  | <br>Clockwise        |  | <br>ANTI - CLOCKWISE |  | <div>Clockwise</div> <div>Clockwise</div> <div>Clockwise</div> <div>Counter clockwise</div> <div>Anti-Clockwise</div> |

Choose a letter from the "Rotation" box presented on your right to answer the following questions below.

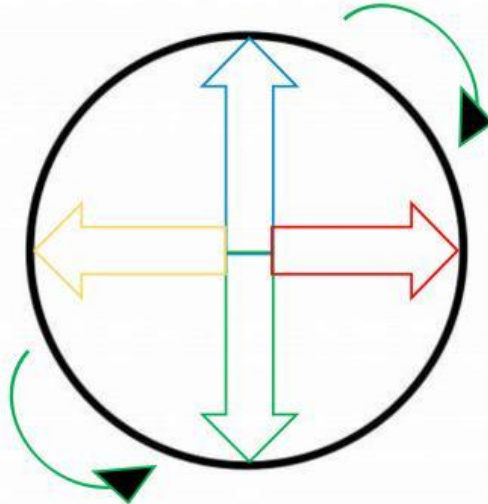
- Which direction do the hands of a clock move?   a.
- Opposite to clockwise is...?   b.
- If you turn a doorknob to the right, what direction are you turning it in?   a.
- If you were to walk around a circular track in the direction opposite to the hands of a clock, what direction would you be walking in?   b.
- How many quarter turns do you make when you go counterclockwise in total?   4
- True or False: Counterclockwise rotation is also known as anticlockwise rotation.
- True or False: Spinning a top in the direction opposite to a clock's hands is anti-clockwise.
- True or False: Turning the pages of a book from right to left is a clockwise action.
- True or False: Twisting a jar lid counterclockwise loosens it.
- The arrows are being turned clockwise. Match the pictures to the turns.

| Rotations |                   |
|-----------|-------------------|
| a.        | Clockwise         |
| b.        | Counter clockwise |
| c.        | Anti-clockwise    |



### Understanding Quarters: Clockwise and Counterclockwise:

**Concepts** of *clockwise* (moving in the direction of a clock's hands) and *counterclockwise* (moving in the opposite direction to a clock's hands) rotations.



- If you turn the circle halfway clockwise, which arrow will point to the top?  
a. Green      b. Blue      c. Yellow      d. Red
- Make a half turn clockwise from the red arrow, which color arrow will you land on?  
a. Red      b. Yellow      c. Green      d. Blue
- Starting from the yellow arrow and making a quarter turn anti-clockwise, which color arrow will you reach?  
a. Blue      b. Red      c. Yellow      d. Green
- If you make a three-quarter turn clockwise from the blue arrow, which color arrow will be opposite to it?  
a. Yellow      b. Blue      c. Green      d. Red
- How many quarter turns clockwise do you need to make from the red arrow to reach the same position again?  
a. 1      b. 2      c. 3      d. 4
- If you turn the circle by a three-quarter turn anticlockwise, where will the arrow that was pointing to the bottom end up?  
a. Top      b. Bottom      c. Left      d. Right



- The owl makes a whole turn anti-clockwise. How many degrees did it rotate?  
a.  $180^\circ$       b.  $90^\circ$       c.  $360^\circ$       d.  $270^\circ$
- If the owl turns three quarters of a turn clockwise, how many degrees has it rotated?  
a.  $180^\circ$       b.  $90^\circ$       c.  $360^\circ$       d.  $270^\circ$
- If the hour hand is at 1 and the minute hand is at 6, what fraction of a turn has the hour hand completed from the quarter hour to the half hour?

$\frac{1}{2}$  turn

$\frac{1}{4}$  turn

Full turn

$\frac{3}{4}$  turn

## Understanding Quarters: Clockwise and Counterclockwise: <sup>con't</sup>

**Concepts** of *clockwise* (moving in the direction of a clock's hands) and *counterclockwise* (moving in the opposite direction to a clock's hands) rotations.

1. Select the correct answer by clicking the checkbox next to the options provided for the following two questions below.



Circle the **whole** turn.



Circle the **quarter** turn.

Write in your answers for Q1-4 & 9 in the space provided below. Select True or False for Q5-8.

1. If the giraffe completes a full turn clockwise from its original position shown above, what direction is it facing now? Express your answer in degrees. 360°
2. If the giraffe turns halfway clockwise from its original position shown above, what direction is it facing now? Express your answer as either "left" or "right". Right
3. If the giraffe makes a quarter turn counter-clockwise from its starting position, which direction is it facing now? Left a. How many degrees did it turn 90°
4. True or False : If a giraffe sitting in its initial position takes a half turn clockwise, it will end up facing the same direction.
5. True or False : A quarter turn clockwise is the same as a quarter turn anti-clockwise.
6. True or False : If a giraffe is sitting 3 clockwise positions from its original position, it has completed a half turn.
7. True or False : After a whole turn clockwise, a giraffe sitting at the 3 o'clock position will be facing the 9 o'clock direction.
8. True or False : When the giraffe makes a quarter turn clockwise, it will end up facing to the right.



List the clockwise positions of the giraffe in the picture and it's degrees.

1/4 turn = 90°

Full turn = 360°

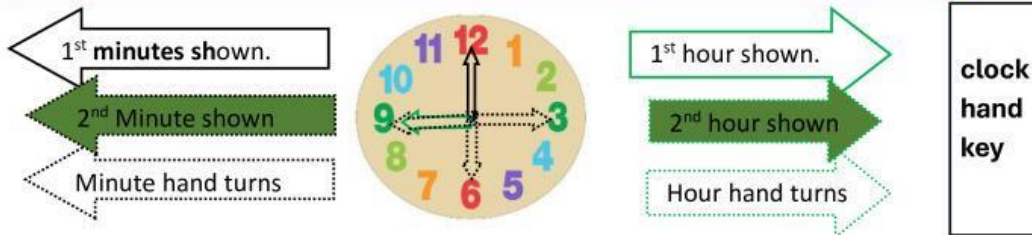
3/4 turn = 270°

1/2 turn = 180°

\_\_\_\_\_ turn = 360°

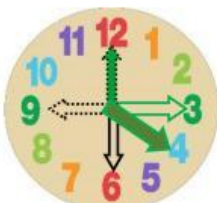
## Understanding Quarters: Clockwise and Counterclockwise: <sup>con't</sup>

**Concepts** of *clockwise* (moving in the direction of a clock's hands) and *counterclockwise* (moving in the opposite direction to a clock's hands) rotations.

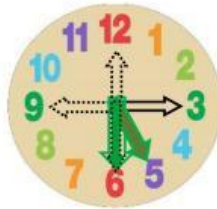


1. If the minute hand makes a three-quarter turn anti-clockwise from 9 o'clock, what angle does it form with the vertical line? Answer in degrees:- 270 °
2. For each question, fill in the required feild to determine the rotation angle and degrees based on the clock's time and rotation direction. Utilize the "clock hand key" as a guide to answer

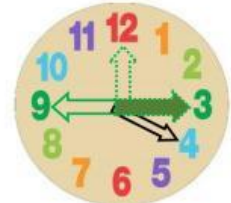
1.



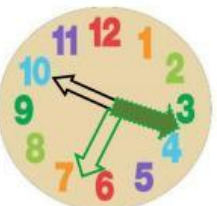
Clock Time : 3:30 - 4:00  
 Clock Hand : minutes  
 Amount of Time: 30 min  
 Turns : 1/2  
 Directions : Right  
 Rotation : Clockwise  
 Angle (Degrees):



Clock Time : 6:15 - 5:30  
 Clock Hand : minutes  
 Amount of Time : 45 min  
 Turns : 3/4  
 Directions : Left  
 Rotation : Counter-clockwise  
 Angle (Degrees) :



Clock Time : 9:20 - 3:20  
 Clock Hand : Hour  
 Amount of Time : 45 min  
 Turns : 1/2  
 Directions : Right  
 Rotation : clockwise  
 Angle (Degrees) :



Clock Time : 6:50 - 3:50  
 Clock Hand : Hour  
 Amount of Time: 3 hrs  
 Turns : 1/4  
 Directions : Left  
 Rotation : Counter- Clockwise  
 Angle (Degrees):



Clock Time : 12:00 - 12:00  
 Clock Hand : Hour  
 Amount of Time : 24 hrs  
 Turns : 4  
 Directions : Left/Right  
 Rotation : Counter-clockwise  
 Angle (Degrees) :



Clock Time : 7:45 - 8:30  
 Clock Hand : minutes  
 Amount of Time : 45 min  
 Turns : 3/4  
 Directions : Right  
 Rotation : clockwise  
 Angle (Degrees) :