Rounding off:

It is a process of trimming (cutting off) a given number.

- Rounding is used to simplify numbers.
- When rounding we are creating simpler numbers that are close to their original value.
- The advantage of rounding is that it gives us numbers that are easier to work with.
- The disadvantage of rounding is that the numbers will not always be exact- reduces accuracy.

Steps (rules) for rounding off:
Circle the place value (digit) to be rounded. We call it rounding digit.
Look to the neighbouring digit to the right.

$$1\ 2\ 3\ 4\ 5\ 6.7\ (8)\ 0\ 1$$

Here, 8 is the rounding digit.
0 is the neighboring digit.

1. If the neighboring digit is less than 5, keep the rounding digit same (rounding down).

$$5\ 6.4\ (2)\ 4\ 1$$

$$= 56.42$$

2. If the neighboring digit is more than 5, the rounding digit increases by 1.

$$5\ 6.4\ (2)\ 7\ 1$$

$$= 56.43$$

3. If the neighboring digit is equal to 5
    a) If the digits following the 5 are zero
    OR
    If there are no digits after 5
    The rounding digit remains same if it is even

$$5\ 6.4\ (2)\ 5\ 0\ 0\ 0\ 0 \qquad\qquad 5\ 6.4\ (2)\ 5$$
$$= 56.42 \qquad\qquad\qquad = 56.42$$

    The rounding digit increases by 1 if it is odd.

$$5\ 6.4\ (7)\ 5\ 0\ 0\ 0 \qquad\qquad 5\ 6.4\ (7)\ 5$$
$$= 56.48 \qquad\qquad\qquad = 56.48$$

    b) If any digits following the 5 are non-zeros, then rounding digit increases by 1.

$$5\ 6.4\ (7)\ 5\ 0\ 0\ 2\ 3\ 0\ 1 \qquad\qquad 5\ 6.4\ (6)\ 5\ 1\ 0\ 2\ 3\ 0\ 1$$
$$= 56.48 \qquad\qquad\qquad\qquad = 56.47$$

$$5\ 6.4\ (6)\ 5\ 0\ 0\ 2\ 3\ 0\ 1$$

$$= 56.47$$

4. a) When rounding to the left-hand side of the decimal, all digits to the right side of the rounding digit will become 0 up until the decimal point. The digits to the right of decimal are dropped.

$$5\ 6\ 4\ (6)\ 5\ 1.0\ 2\ 3\ 0\ 1$$
$$= 564700$$

   b) When rounding to the right-hand side of the decimal, drop all digits to the right of the rounding digit.

$$5.6\ 4\ (6)\ 7\ 1\ 0\ 3$$
$$= 5.647$$