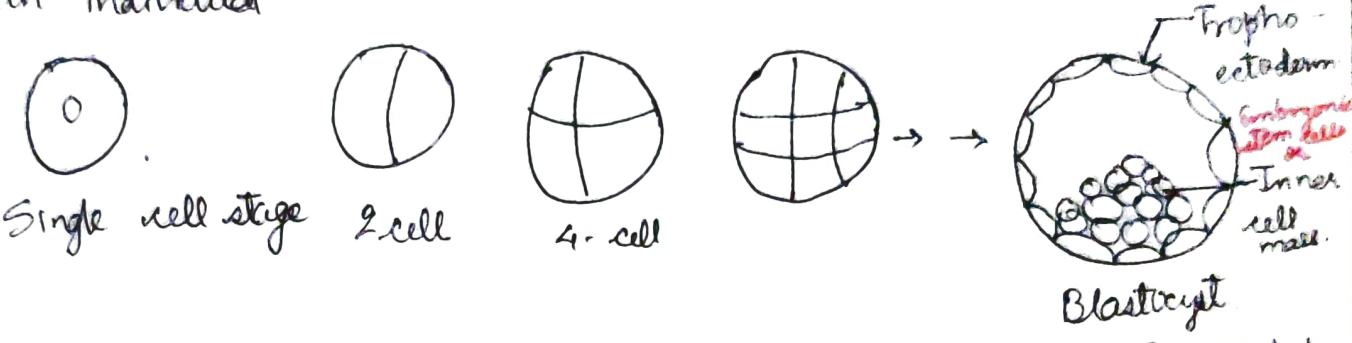
General Concept of potency, commitment, specification, determination, induction, differentiation

① **Potency** :- Simply means ability
In case of dev biology, it refers to Totipotent, Pleuripotent, multipotent

Totipotent - A cell which can give rise to all cell types of an individual.



Early stages are totipotent i.e. 1-celled, 2-, 4-, 8-celled stage

NOTE ① ICM is pleuripotent but not totipotent. It can give rise everything but not the trophoectoderm.

② Totipotency - Complete potency.
Pleuripotency - Almost but not complete potency or ability

③ In most of the time totipotency and pleuripotency terms are used interchangeably.

Pleuripotent -

Multipotent - Can give rise to only limited no. of cells

② **Commitment** :-

Commitment can be divided into 2 steps.

① Specification
- Initial step where a cell has chosen a given path of development but can get reversed also

② Determination
- Irreversible final step of commitment but not yet differentiated.

Depending upon signals available. cell makes a commit

Specification

If a cell specified for developing in a given cell type is kept in neutral medium, this will develop into the given cell type.

But if the same specified cell is kept in a medium having another type of induction or the cell is transplanted to another part body → then specified cell can change specification. It means specification is a late stage where cell is commited but not sure about fate and could be changed on changing stimulus.

③ Differentiation: Change in cell structure/function to become specialized.

→ Induction – Surrounding cell/medium can make the nearby cell to go for a particular type of development. These cells/medium may have molecules (called as inducers) which influence a given cell to go towards specific developmental path.