

Good essay about metaphase; the metaphase plate develops that ensures that each n...

[Environment](#), [Plants](#)



- While conducting research, scientists need to understand the main variables within their experiments. Define and provide an example of both an independent and dependent variable.

In any research there are mainly two variables; the independent and the dependent variables. Any scientist needs to understand the variables very well because of the following reasons. First the variable determines the type of methodology that can be used in the study. What this means is that the type or variables would determine how the whole research is carried out. For example, a variable might have qualitative or quantitative aspects that would be the basis on choosing the methodological approach. Secondly, testing the variables forms the major part of any research and, therefore, understanding the variable is the only sure way of meeting the objectives of the research. Independent variable is the variable that is manipulated in the experiment to observe its effects on the dependant variable (“ Introduction to Research,” n. d). The depended variable is the variable whose effects are observed during an experiment. It changes as the independent variable is changed. For example, in an experiment where by the effects of temperature on the rate of transpiration in a leafy plant-temperature is the variable that is manipulated to study how transpiration changes. In this case therefore, temperature is the independent variable while the rate of transpirations is dependent variable.

- Describe the process of transpiration within plants and provide details on two environmental factors that impact transpiration.

Transpiration is the process through which plants lose water though stomata (Sarah Friedl, 2014) into the atmosphere. The process is important in plants

since it helps in the uptake of nutrients from the soil via the roots. The process occurs in that stomata located underneath most of the leaves and surrounded by guard cells. The guard cells control the opening and closing of the pores. Depending on the environmental characteristics and the amount of water in the soil, the stomata would open and close accordingly. There are various factors that affect the rate of transpiration. For example, temperature; the rate of transpiration increase as temperature increases. Higher temperatures cause the stomata to open and releases water into the atmosphere while cold temperature makes the stomata close. The increase is not infinite since there is the optimal temperature whereby the rate of transpirations would be highest and would reduce after that temperature. The plant may wither or die in case of excessive transpiration. The relative humidity of the environment also affects the rate of transpiration. Drier air increases the rate while cold air reduces since the saturation levels of water in the atmosphere help in the opening and closing of the stomata.

- Describe in detail the phases of mitosis.

Mitosis is the nuclear division that produces two identical daughter cells ("The Cell Cycle & Mitosis Tutorial," n. d). It occurs in the following stages.

Interphase; the cells undergoes metabolic activity in readiness for mitosis.

The chromosomes are not clear although the nucleus might be visible.

Prophases; the chromatin in the nucleus condenses and can be visible using a microscope. The centriole begins moving towards opposite ends and fibers tend to separate from the centromeres.

Prometaphase; the nuclear membrane dissolves and the kinetochores are

created by proteins attaching to the centromeres. The microtubules join the kinetochores making the chromosomes to begin to move.

Anaphase; separation occurs at the kinetochores and move in the opposite sides.

Telophase; the moving chromatins arrive at the opposite sides of the cells. A new membrane forms around each daughter cell. Spindle fibers begin to disappear and the chromosomes disperse. Partitioning of the cell begins.

Cytokinesis; in animals cells, the centre of the cell fully contracts resulting a split leading to two daughter cells each with its nucleus. In plants, a rigid wall develops in-between the daughter cells.

## **Work cited**

“ The Cell Cycle & Mitosis Tutorial.” Accessed from [http://www.biology.arizona.edu/cell\\_bio/tutorials/cell\\_cycle/cells3.html](http://www.biology.arizona.edu/cell_bio/tutorials/cell_cycle/cells3.html) December 14, 2014

“ Introduction to Research. Understanding Variables.” Accessed from <http://jan.ucc.nau.edu/~mid/edr610/class/variables/variables/lesson3-1-1.html> on December 14, 2014

Sarah Friedl. “ What Is Transpiration in Plants? - Definition, Rate & Process.” 2014. Accessed from <http://education-portal.com/academy/lesson/what-is-transpiration-in-plants-definition-rate-process.html#lesson> on December 14, 2014.