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WORKSHEET  
Life Science 12  
Week 4

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Once your work has been uploaded, I will choose a few questions at random, and it will be for marks.

### Lesson 1 and 2

*{Adapted from: Mind Action Series Textbook}*

#### Question 1 [9]

If T represents the dominant allele for tallness. Give three possible genotypes and phenotypes when a tall plant is crossed with a short plant. (9)

#### Question 2 [12]

*{Adapted from: IEB Life Science Paper 1, 2020}*

Read the article on the next page. Use the information in the text and your own knowledge to answer the questions that follow:

# WORKSHEET

## Life Science 12

### Week 4

#### Mendel and his research on the mechanisms of inheritance



Gregor Johan Mendel worked with pea plants in the gardens of the monastery. The focus of his research was to investigate the mechanism of inheritance.

Mendel's garden produced a large volume of data to analyse:

- Twenty eight thousand pea plants
- Forty thousand flowers
- Four hundred thousand seeds

[Source: <<https://www.britannica.com>>]

The table below shows some of the results of his monohybrid crosses of pea plants.

**Table showing three of Mendel's monohybrid crosses of pea plants**

| Characteristic                     | Offspring of F <sub>1</sub> | Offspring of F <sub>2</sub> (numbers) | Ratio of F <sub>2</sub> |
|------------------------------------|-----------------------------|---------------------------------------|-------------------------|
| Height:<br>Tall x dwarf            | all tall                    | 787 tall, 277 dwarf                   | 2,84 : 1                |
| Seed pod colour:<br>Green x yellow | all green                   | 428 green, 152 yellow                 | 2,82 : 1                |
| Seed shape:<br>Round x wrinkled    | all round                   | 5475 round, 1850 wrinkled             | 2,96 : 1                |

[Adapted: Mukherjee, S. 2016. The Gene. Page 52; Clegg, C.H. & Mackean, D.G. 1994. Advanced Biology pg. 615]

- 2.1 Explain your understanding of *monohybrid inheritance*. (2)
- 2.2 Differentiate between the terms *dominant* and *recessive*. In your explanation refer to one example from the table above. (4)
- 2.3 Provide THREE well-explained reasons why Mendel's experiments are regarded as an example of good scientific practice. (6)

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**Lesson 2**

**Question 3 [22]**

*{Adapted from: Mind Action Series Textbook}*

3.1 Draw punnett squares to show the expected phenotypes and genotypes in the offspring from a cross between a:

3.1.1 homozygous brown-eyed and a blue-eyed rabbit (4)

3.1.2 heterozygous brown-eyed and homozygous a blue-eyed rabbit (4)

3.1.3 homozygous brown-eyed rabbit and a heterozygous brown-eyed rabbit (4)

3.2 Using the symbols W for normal wings and w for vestigial wings (*remains of wings that were once functional*), draw a genetic diagram to show what kind of offspring would be produced if a heterozygous fly mated with one which was homozygous for normal wings. (10)

**[Total: 43 Marks]**