Name _____ Period _____
Due date _____

The Grass is Greener PROJECT

In this project each team will grow a "lawn" of grass under a different environmental conditions. You will regularly water your lawn and measure the average length of the 3 longest blades of grass. At the end of the project, you will also "mow" your lawn and measure its mass.

ENVIROMENTAL CONDITIONS

- Normal potting soil
- Potting soil with Salt
- Potting soil with Motor Oil
- Potting soil with Miracle Grow
- Potting soil with Acid Rain
- Sandy soil

MAKE A PREDICTION: Which lawn will grow the best? Rank the 6 factors above from greatest mass to least mass

GREATEST MASS #1 _____

#2 _____

#3 _____

#4 _____

#5 _____

LEAST MASS #6 _____

MATERIALS:

- Cake pan
- Masking tape
- Potting soil
- Grass seed
- Trowel
- Environmental Factors (Salt, Motor Oil, Miracle Grow, Acid Rain, Sand)

PROCEDURE

(1) Make a label for your cake pan with a piece of masking tape.

WRITE: - Environmental Factor
- Period

Tape this label on the side of the cake pan.

(2) Select your environmental factor then plant your lawn according to the following table:

FACTOR SELECTED: _____

Environmental Factor	Set Up
Normal Potting Soil	Add 1000 ml. of potting soil plus 30 ml. of grass seed to your pan and mix well.
Acid Rain	Add 1000 ml. of potting soil plus 30 ml. of grass seed to your pan and mix well
Salt *	Add 1000 ml. of potting soil with 3 grams of salt. Then add 30 ml. of grass seed and mix well.
Motor Oil *	Add 1000 ml. of potting soil plus 40 ml. of motor oil. Mix well. Then add 30 ml. of grass seed and mix well again.
Miracle Grow *	Add 1000 ml. of potting soil plus 40 ml. of Miracle Grow and mix well. Then add 30 ml. of grass seed and mix well again.
Sandy Soil	Add 500 ml. of potting soil with 500 ml. of sand. Mix well. Then add 30 ml. of grass seed and mix well again.

* You will only add this factor one time on set up day

(3) WATER – All teams will water your lawn on set up day with 500 ml. of tap water EXCEPT THE ACID RAIN TEAM. The Acid Rain team will use Acid Rain Water every time they water their lawn.

(4) Set your lawn in the window sill.

OBSERVATIONS

DATE	DESCRIBE YOUR LAWN (color, size, shape, # of blades, changes)

Data Table

AVERAGE LENGTH (in.) of 3 Longest Blades

(Please also write your data on the class wall chart)

ROUND TO THE NEAREST 10TH OF AN INCH

DATE									
NORMAL SOIL									
SALT									
MOTOR OIL									
MIRACLE GROW									
ACID RAIN									
SANDY SOIL									

Make a **LINE GRAPH** of the class data on the graph paper below.

You will need 6 LINES, one for each factor. Color each line a different color by using the color key on the left:

Normal soil =

Salt =

Motor oil =

Miracle Gro =

Acid Rain =

Sandy soil =

AVERAGE LENGTH OF GRASS BLADES

AVERAGE LENGTH (in.)

DATE

DATA TABLE

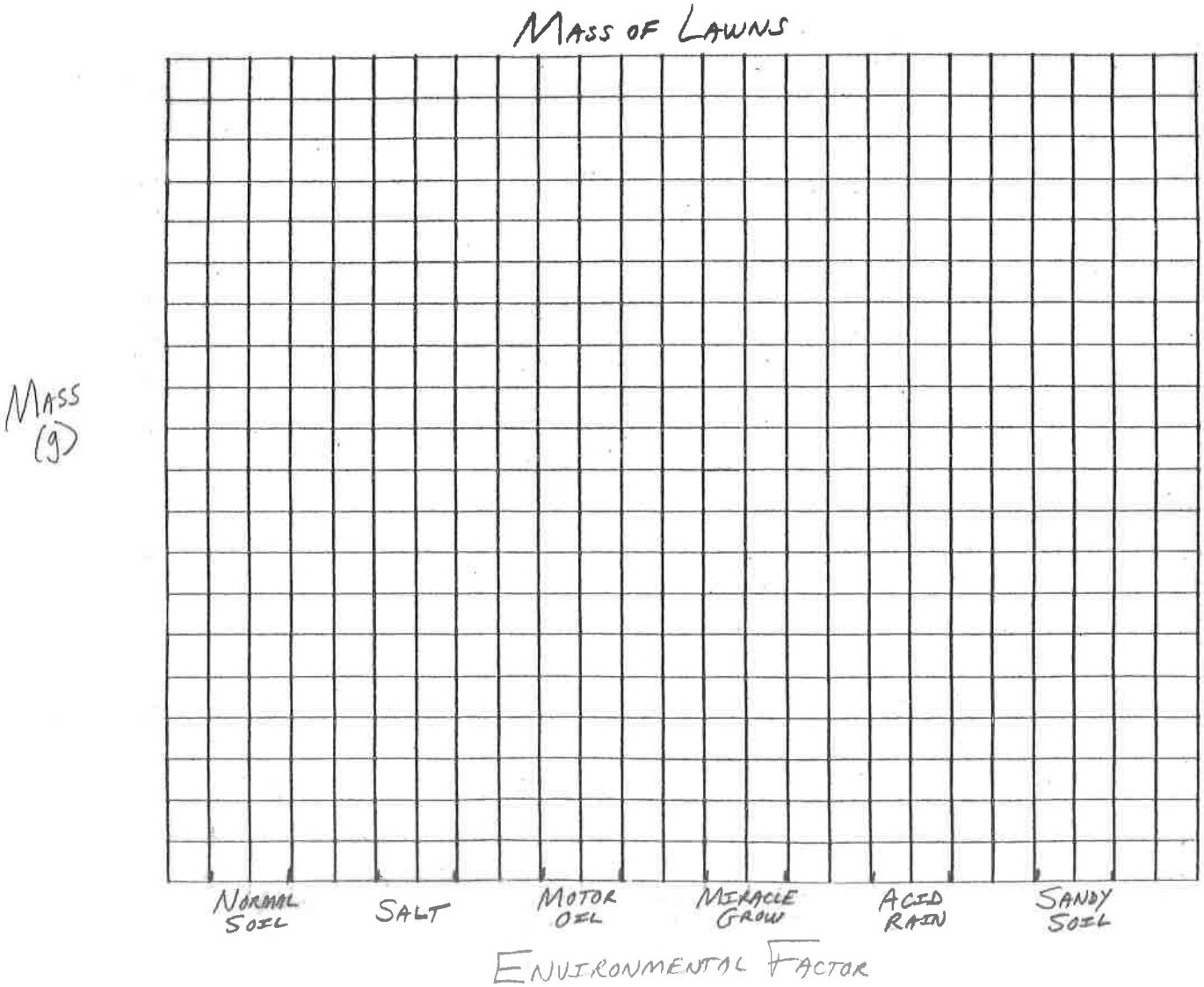
MASS (g) OF MOWED LAWN

(Please also write your data on the class wall chart)

FACTOR	Normal	Salt	Motor Oil	Miracle Grow	Acid Rain	Sandy Soil
MASS (g)						

Make a BAR GRAPH on the graph paper below.

- You will make 6 BARS, one for each factor
- Color each bar a different color



ANALYSIS AND CONCLUSIONS:

1. How accurate was your prediction on the 1st page (mass of lawns) compared to the actual results? Explain.

_____

_____

2. Which environmental factor enabled the grass to grow the TALLEST? _____

3. Which environmental factor enabled the grass to grow the HEAVIEST? _____

SCIENTIFIC METHOD

____ 4. What Problem/Question were we investigating in this project?

A. Do grass seeds grow better with more water?
B. Does potting soil improve the growth of grass seeds?
C. How do environmental factors impact the growth of grass?

5. STATE A HYPOTHESIS regarding your environmental factor and its effect on grass growth.
(HINT: A hypothesis is a statement you can test and measure. You may want to write it as an "If/Then" statement)

_____

_____

_____ 6. What was the independent variable in this experiment?

A. Type of grass seed B. Environmental factors C. Height of the grass

_____ 7. What was the dependent variable in this experiment?

A. Type of grass seed B. Environmental factors C. Height of the grass

_____ 8. What was one constant in this experiment?

A. 30 ml. of grass seed B. 3 grams of salt C. 40 ml. of motor oil

9. DRAW A CONCLUSION (i.e. was your hypothesis true or false?)

_____

Regents Practice Questions

Base your answers to questions 10 through 12 on the information below and on your knowledge of biology.

An experiment was carried out to answer the question "Does the pH of water affect the growth of radish plants?" Two groups of ten radish plants were set up. One group was watered with water having a pH of 3.0, and the other group was watered with water having a pH of 7.0. Both groups of plants received the same amount and intensity of light, the same amount of water, and they were grown in the same type of soil. The heights of the radish plants were measured every 2 days for a period of 2 weeks.

10. Which sentence is a possible hypothesis that was tested in this experiment?

(1) Does the pH of water affect the growth of radish plants?
(2) Will the amount of water alter the heights of the radish plants?
(3) The temperature of the water will affect the heights of the radish plants.
(4) The pH of the water will affect the heights of the radish plants.

11. What was the dependent variable in this experiment?

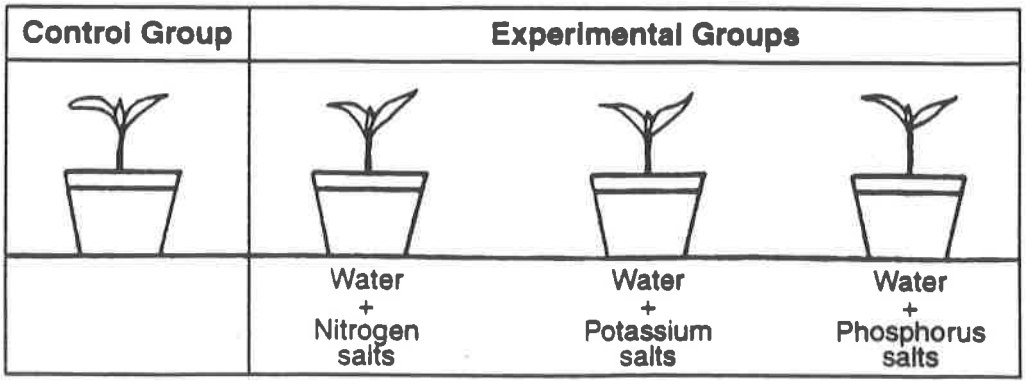
(1) heights of the plants
(2) pH of the water
(3) temperature of the water
(4) type of soil

12. Which activity might help to increase the validity of this experiment?

(1) repeating the experiment several times
(2) using two different types of radish seeds in each group
(3) using the same pH for both groups of plants
(4) placing one set of plants in sunlight and one in darkness

---

An experiment was performed to determine the effect of different mineral salts on plant growth. Forty pots containing genetically identical plants were divided into four equal groups and placed in a well-lighted greenhouse. Each pot contained an equal amount of nonmineral potting soil and one plant. Minerals were then added in equal amounts to each experimental group of pots as shown below.



13. For the experiment to be valid, what should be added to the control group of pots?

1 water
2 nitrogen salts
3 potassium salts
4 potassium and phosphorus salts

Kevin & Kell