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# Student

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# LAB MANUAL

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# Wheat Planting & Growth Lab Manual - Student Version

## Introductory Questions:

Why is wheat important? \_\_\_\_\_

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I predict my wheat plants will \_\_\_\_\_

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I am excited to learn about \_\_\_\_\_

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# Wheat Planting & Growth Lab Manual - Student Version

**Draw and label a wheat kernel:**

Include the bran, germ and endosperm.

**Draw and label a wheat plant:**

Include the head (beard & kernels), stem, leaves and roots.

**Materials:**

- Wheat seeds
- Potting soil
- Plastic cups or plastic/clay pots
- Watering can
- Marker
- Labels (optional)
- Ruler

**Planting Directions:**

- Fill cups or pots 2/3 full with moist planting soil. Leave at least 0.5 in. of space below the lip of the cup.
  - For a paper cup with a 1.5 in. depth, plant 2-3 seeds per cup. For 4 in. or 6 in. pots, plant 6-8 seeds per pot.
- Label pots with your name or the names of those in your group.
- Place containers in a pan or tray to catch drainage water.
- Place the containers and drainage tray in a well-lit area that will remain at room temperature.
  - Grow lights can be used in place of or as a supplement to natural sunlight.
- Water as needed. Soil should be kept moist, but not overly wet.

**Monitoring Growth:**

- One week after planting, do an initial observation of any plant growth.
- Following the first weekly observation, observe plant growth every 2 weeks. Plan to observe plant growth on the same day of the week for consistent monitoring.
- Record observed growth in your lab manuals (following pages).
  - In the growth chart, note plant height, number of leaves, root length (if using clear cups), growth stage/Feekes stage and plant health.

## Growth Stages:

**Germination** - Germination occurs as seed absorbs water and activates to grow the new plant. Germination happens below the soil.

*Photo Courtesy of Brandon Gerrish*



**Emergence** - The wheat plant emerges from the soil roughly 7 to 10 days after planting.

*Photo Courtesy of Kristie Keys*



## Growth Stages:

**Tillering** - Additional stems known as tillers grow from the main stem of the wheat plant. Tillers help the crop survive winter dormancy and increase yield potential.



**Dormancy** - The wheat plant goes dormant as temperatures drop around 32°F. Growth stops above ground, but roots continue to develop.



## Growth Stages:

**Regrowth** - Active growth resumes as temperatures rise. Tillering begins again, the stem elongates and leaves expand.



**Reproductive** - The wheat head fully emerges and the kernels begin to fill and harden.



## Growth Stages:

**Maturation** - The kernels harden and then dry out.



## Feekes Scale:

**Stage 1** - The wheat plant emerges from the soil.

*Photo Courtesy of Brandon Gerrish*



**Stage 2** - Tillers begin to grow from the main stem.

*Photo Courtesy of Brandon Gerrish*



## Feekes Scale:

**Stage 3** - Tillers are fully formed and may twist spirally.



**Stage 4** - The secondary root system forms while leaves grow larger.

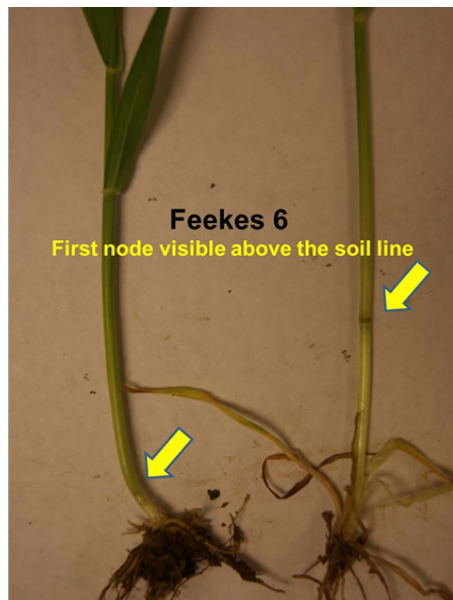
**Stage 5** - The plant begins to stand up straighter and heads begin to develop.



## Feekes Scale:

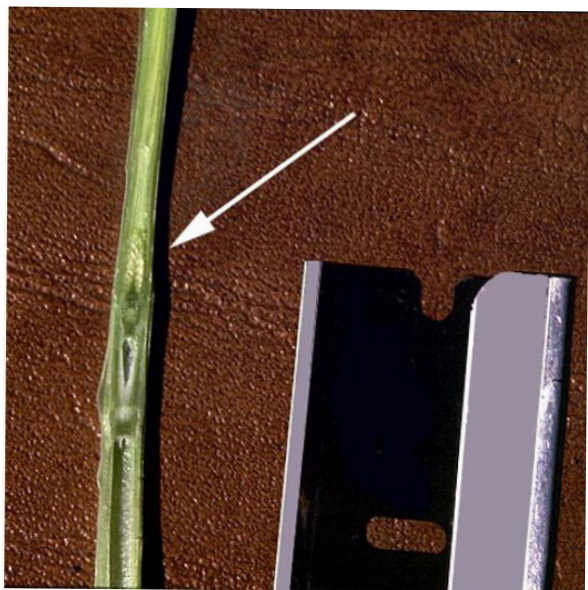
**Stage 6** - A bump or joint in the stem, known as the node, can be seen above the soil.

*Photo Courtesy of Paul Pierce*



**Stage 7** - The next node is visible higher up on the stem.

*Photo Courtesy of Calvin Trostle*



## Feekes Scale:

**Stage 8** - The last leaf, known as the flag leaf, unfolds.

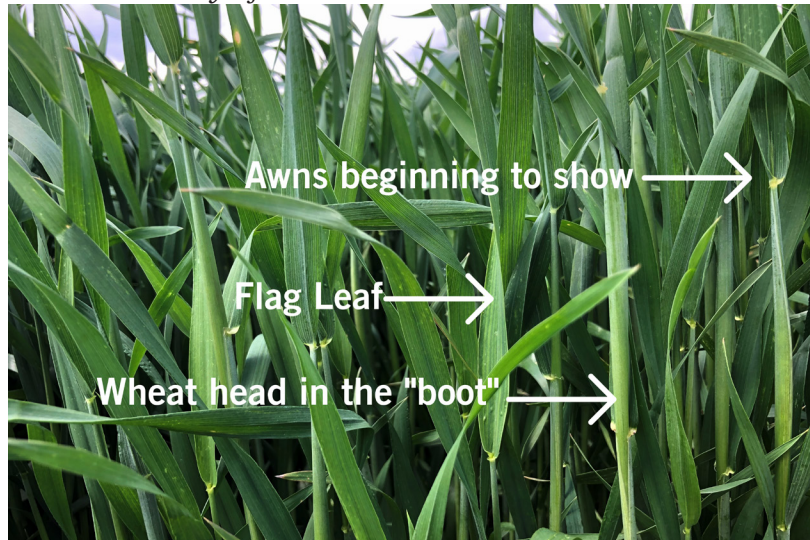
*Photo Courtesy of Jourdan Bell*



**Stage 9** - The flag leaf fully unfolds.

**Stage 10** - The head swells inside the flag leaf sheath, also known as the “boot.”

*Photo Courtesy of Jourdan Bell*



## Feekes Scale:

**Stage 10.5** - The last leaf, known as the flag leaf, unfolds.

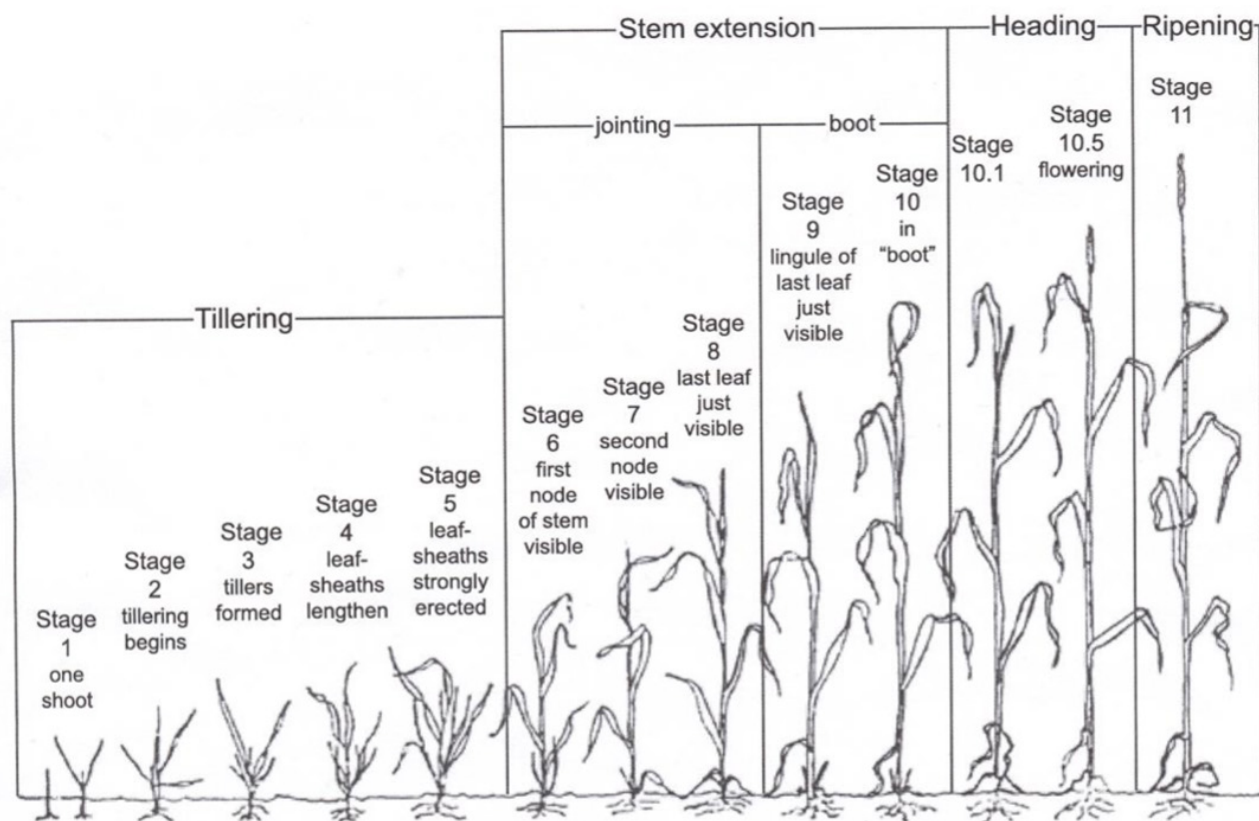


**Stage 11.2** - If pressed, the kernels feel soft like dough.



## Feekes Scale:

**Stage 11** - The kernels are dry and the plant turns golden brown.



# Wheat Planting & Growth Lab Growth Journal

**Name or Group:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Plant Height:** \_\_\_\_\_

**Root Length (only record if planted in clear cup):** \_\_\_\_\_

**Number of Leaves:** \_\_\_\_\_

**Color:** \_\_\_\_\_

**Growth Stage:** \_\_\_\_\_

*Germination, Emergence, Tillering, Dormancy (outdoor plants only), Regrowth (outdoor plants only),  
Reproductive, Mature*

**Feekes Scale:** \_\_\_\_\_

*Tillering (1, 2, 3, 4, 5), Stem Extension (jointing - 6, 7, 8; boot - 9, 10), Heading (10.1-10.5.2), Ripening (11.1-11.4)*

**Plant Condition:** \_\_\_\_\_

*Does the plant look healthy? Is there clear growth from the previous observation?*

**Other Observations:** \_\_\_\_\_

\_\_\_\_\_

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**Questions:** \_\_\_\_\_

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