Ag Shop Skills Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mr. Meredith Period:\_\_\_\_\_\_\_\_\_

**CONCRETE**

**What is Concrete?**

1. Concrete -
2. Portland Cement -
3. Mortar -

**Why Concrete?**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Insect and Rodent Proof
* Decay Resistant
* Highly Storm Resistant
* Wear Resistant
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Strong
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Easy to use with little expense
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Sanitary and easy to clean
* Easily Recycled

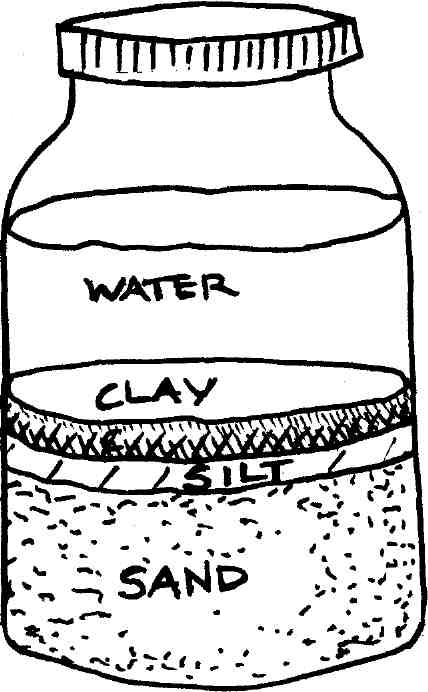
**Why not Concrete?**

* Wears away when exposed to moving water

**Importance of Silt Test**

* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_is key for looking at the \_\_\_\_\_\_\_\_\_\_ that will be mixed in with concrete ingredients.
* Ideally, you want a sandy loam or more \_\_\_\_\_\_\_\_\_\_\_ soil.
* Sandy soil is helpful especially due to the \_\_\_\_\_\_\_\_\_\_\_ and\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of concrete.
* If concrete doesn’t have this ability it can crack.

**Silt Test**



**Mixing Concrete!**

* You mix concrete to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The ratio is expressed in a 3 digit number called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* EX: a 1-2-3 mix has 1 part cement, 2 parts fine aggregate (sand) and 3 parts coarse aggregate

Your goal for your ratio is to get a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Workable Mix**

* Refers to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the wet concrete after the carious ingredients have been mixed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Characteristics of A Workable Mix**

* + All \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are clean
  + No dry powder is present
  + No \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in color
  + Every particle of aggregate is covered with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ paste
  + Mixture can be moved with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Chemical Process**

* Concrete goes through a chemical process known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Hydration – This is where the \_\_\_\_\_\_\_\_\_\_\_ reacts with the cement, which \_\_\_\_\_\_\_\_\_ the other components together, eventually creating a \_\_\_\_\_\_\_\_\_\_\_\_-like material.

**Chemical Admixtures**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – Speed up the chemical process of Hydration (CaCl, NaCl)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *-*  Slow the hydration process down
* \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*–* trap air bubbles in the concrete to reduce damage during Freeze/Thaw
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *–* Changes the color

**Estimating Materials**

* Don’t want to spend money on extra or be short on a job. (both cost $)
* Order in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* 1 cubic yard= \_\_\_\_\_\_\_\_\_\_\_ cubic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Formula
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_’ X \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_’ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_’
    - You may have to convert \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_ (divide by 12)

**Example # 1**

Always add an additional \_\_\_\_\_\_% to make sure you have enough. Since we cannot

order in half yards, round \_\_\_\_\_ to the nearest whole yard.

**Example # 2**

**Formulas for Area**

**Triangle** - ½ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) x Thickness

**Rectangle**  - \_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Circle** - (3.14 x \_\_\_\_\_\_\_\_\_\_\_\_\_\_) x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Trapezoid**  - \_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_ x Thickness

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2**

**Practice Problems**

**Preparing for a Form**

* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* – metal or wooden structure that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the concrete to the desired shape or form until it hardens.
* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_–* is the concrete \_\_\_\_\_\_\_\_\_ that provides a solid \_\_\_\_\_\_\_\_\_\_\_\_ foundation for brick stone or black walls.

**Constructing Forms**

* Uses \_\_\_\_\_\_\_\_\_\_\_\_\_, Clean, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lumber
* Sharpen \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ evenly so that they can be driven in with ease
* Place stakes\_\_\_\_\_\_\_\_\_\_ inches apart
* Drive \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ through stakes (duplex Nails) are best
* Use wood sprayed with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ stakes allow you to put at desired height
* Transit or\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to determine desired \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Average slope will be \_\_\_\_\_\_\_\_\_\_\_\_\_” fall.

**Making Joints**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Joint – place where one pouring \_\_\_\_\_\_\_\_\_\_\_\_ and another starts
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Joint – Is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ break which permits concrete to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ without cracking. These joints are usually made with wood, galvanized metal or asphalt.
* Note – Control joints do not prevent concrete from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Reinforced Concrete**

* Concrete can be strengthened by adding \_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_ mesh.
* As a rule of thumb you should lap bars\_\_\_\_\_\_\_\_\_\_\_\_\_\_ times the diameter.
* Ex. Rebar ½” should be put every\_\_\_\_\_\_\_\_\_\_ inches
* \_\_\_\_\_\_\_\_\_\_\_\_\_” should be lapped every \_\_\_\_\_\_\_\_\_\_ inches
* Rebar should be at least ¾” from the surface. On average it is 1 ½” below the surface

**Pouring Concrete**

* Must have all tools \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ concrete starts to set in \_\_\_\_\_\_\_\_ min.
* After spreading concrete you need to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ it
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – moving a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_back and forth to remove \_\_\_\_\_\_\_\_\_\_\_\_ concrete
* Then you will need to \_\_\_\_\_\_\_\_\_\_\_ your concrete.
* Tamping – this is the process of settling the rocks at the bottom of your project

**Finishing**

* Then you need to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ your project
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – bringing the \_\_\_\_\_\_\_\_\_\_ aggregate (sand) to the surface – this will make your concrete \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Finish – will leave your concrete \_\_\_\_\_\_\_\_\_\_\_\_\_ so that you will not slip
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Finish - This will leave you with a \_\_\_\_\_\_\_\_\_\_\_\_\_ finish (more aesthetic than structural)

**Curing Process**

* Curing is the amount of \_\_\_\_\_\_\_\_\_\_\_\_ from consolidation to it reaches your desired \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Concrete takes hours to set but takes \_\_\_\_\_\_\_\_\_\_\_\_\_ days to be cured!
* During this time it’s important to keep the concrete \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ so that you develop good \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and strength.
* Strength increases with \_\_\_\_\_\_\_\_\_\_\_\_!!!