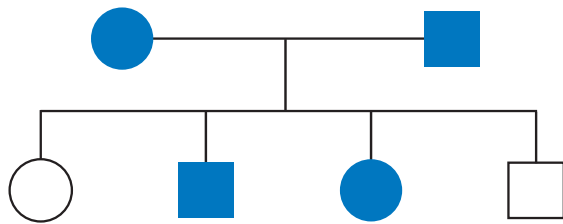
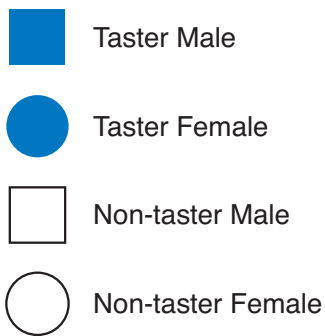


"What Do You Already Know?" Survey

Directions: Use information below and the Pedigree Chart to answer questions 1–3.

Some people have the ability to taste a chemical called PTC. This is a dominant trait. To these people, PTC tastes extremely bitter. We will call these people "tasters". Other people cannot taste PTC at all. This is a recessive trait. We call these people "non-tasters". Use the pedigree chart below to answer the following questions.



1. What is the genotype of the mother?

- (A) Tt
- (B) tt
- (C) TT
- (D) Cannot determine

2. What is the genotype of the father?

- (A) Tt
- (B) tt
- (C) TT
- (D) Cannot determine

3. What is the genotype of the non-taster daughter?

- (A) Tt
- (B) tt
- (C) TT
- (D) Cannot determine

Activity 1: Take a Good Look at Yourself

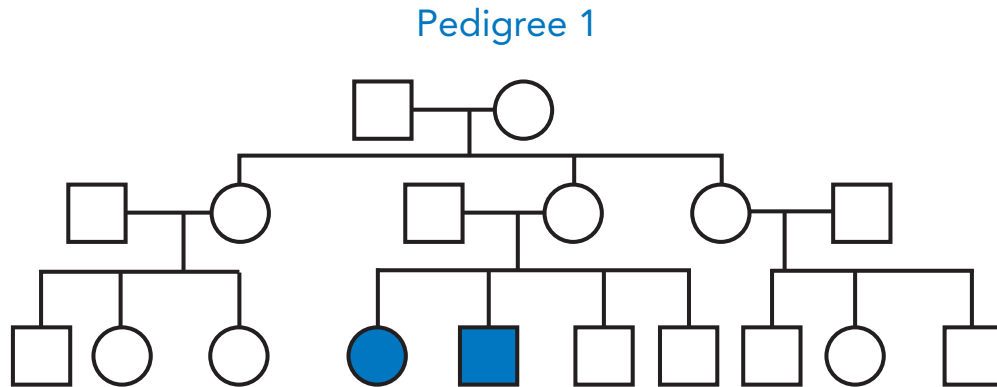
1a. **Complete** your personal inventory in the following chart. On the next page you will find photos/drawings that will help you identify each trait.

Human Trait Inventory				
Traits	Phenotype	(1a) My Phenotype	(1b) All Students Phenotype	Class Percentage (%)
Tongue	* Tongue Roller			
	Non-Tongue Roller			
Earlobes	Attached			
	* Unattached			
Smile	* Dimples			
	No Dimples			
Hairline	Widow's Peak			
	Straight Hairline			
Interlaced Finger	Left thumb on top			
	Right thumb on top			
Thumb	* Straight thumb			
	Hitchhiker thumb			
Little Finger	Bent			
	Straight			
Second Toe	Longer than big toe			
	Shorter than big toe			
Freckles	Has freckles			
	No freckles			
Eye Shape	Almond (oval)			
	Round			
Chin	Has cleft			
	No cleft			

1b. **Record** numbers of all students with each phenotype in the next column (1b), then **compute and record** the percentage of the class for the phenotype of each trait. **Highlight or circle** the class percentage for the four phenotypes noted with an asterisk.

Activity 2: Check Your Understanding

Answer numbers 1–4 using Pedigree 1 below.



1. How many generations are shown in Pedigree 1?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

3. Which statement below is true of Pedigree 1?

- (A) Three of the grandchildren have the trait.
- (B) Ten grandchildren are shown in the pedigree.
- (C) All of the first generation offspring are female.
- (D) Both the father and the mother have the trait.

2. How many of the grandchildren have the trait in Pedigree 1?

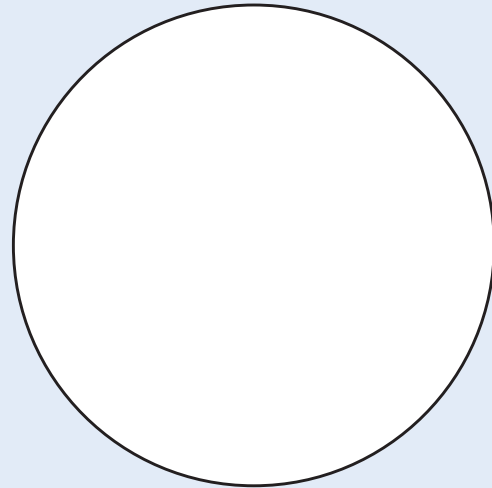
- (A) 1
- (B) 2
- (C) 3
- (D) 4

4. What is the probability of having the trait in Pedigree 1?

- (A) $\frac{1}{9}$
- (B) $\frac{1}{11}$
- (C) $\frac{2}{9}$
- (D) $\frac{2}{20}$

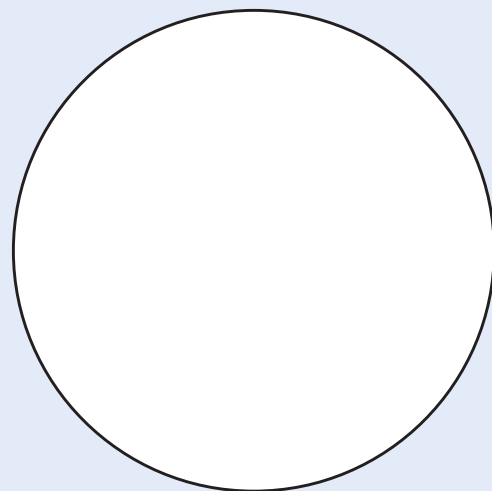
Activity 6: A Different Type of Cell Division: Meiosis

6b. **Arrange** homologous pairs of chromosomes in a random pattern in the *nucleus* of the cell. (You should have six pipe cleaners total in the nucleus.) **Draw and label** (e.g. nuclear membrane, homologous chromosomes) a model of your cell nucleus and chromosomes, and **name** the phase.















Meiosis I-Phase: _____

6c. In this phase, the chromosomes have shortened and thickened and are now visible as distinct chromosomes. To simulate this, add the second chromatid to each chromosome and connect them with the small pieces of pipe cleaners (simulating the centromeres). **Draw and label** (e.g. nuclear membrane, homologous chromosomes, chromatid, centromere) your arrangement and **name** the phase.



Meiosis I-Phase: _____

Activity 9: Engineering a Hypothetical Baby

Trait		Physical Features					
		Dominant				Recessive	
		Genotype		Phenotype		Genotype	Phenotype
1	Face Shape	RR, Rr		Round 		rr	Square 
2	Chin Size	VV, Vv		Large 		vv	Small 
3	Chin Shape	SS, Ss		Round 		Ss	Square 
4	Cleft Chin	LL, Ll		Absent		ll	Present
5	Hair Colour	BB	Black	Bb	Brown	bb	Blonde
6	Hair Body	CC	Curly	Cc	Wavy	cc	Straight
7	Widow's Peak	WW, Ww		Present 		ww	Absent 
8	Eyebrow Colour	HH	Darker than Hair	Hh	Same as Hair	hh	Lighter than Hair
9	Eyebrow Size	TT, Tt		Thick 		tt	Thin 
10	Eyebrow Link	NN, Nn		Not Connected 		nn	Connected 
11	Eye Colour	EE	Brown	Ee	Grey	ee	Blue
12	Eye Distance	DD	Close Together	Dd	Medium Distance	dd	Far Apart
13	Eye Size	ZZ	Big	Zz	Medium	zz	Small