Name _____ Course/Section_____

Date _____ Professor/TA _____

Activity 14.4 How can you determine all the possible types of gametes?

To solve genetics problems in which genotypes are given, you must first know what types of gametes each organism can produce.

1. How many different kinds of gametes can individuals with each of the following genotypes produce?

a. *AA*

b. *aa*

c. *Aa*

d. *AaBB*

e. *AaBb*

f. *AaBbCC*

g. *AaBbCc*

h. *AaBbCcDdEeFf*

2. Based on your answers in question 1, propose a general rule for determining the number of different gametes organisms like those described in question 1 can produce.

3. Two individuals have the genotypes *AaBbCcDd.*

a. How many different types of gametes can each produce?

b. What are these gametes?

c. You set up a Punnett square using all the possible gametes for both individuals. How many "offspring squares" are in this Punnett square?

d. If you completed this Punnett square, how easy would it be to find all the "offspring squares" that contain the genotype *AaBBccDd*?

e. Given that the genes are all on separate pairs of homologous chromosomes, what other method(s) could you use to determine the probability of these individuals having any offspring with the genotype *AaBbccDd*?