Genetics Name:

Hunger Games Genetics Period:

Learning Goal: I will be able to determine the potential genotypes of parents, given the desired phenotype of offspring, and support my opinion with evidence from Punnett Squares.

Scenario: *Career District Officials from district Four want to guarantee that one of their tributes will win the next Quarter Quell (100th Hunger Games). It is rumored that the Quarter Quell arena will be a desert environment that favors tributes with dark features, providing them with natural protection from the sun. As usual, they also want tributes that have athletic body types and above-average intelligence because these characteristics, more often than not, lead to winning tributes (and a winning district). In the next Quarter Quell, it is said that the tribute pool will consist of offspring of former Victors.*

Your Task: You have been hired to determine the genotypes that potential parents should have in order to produce the best probability of a tribute being selected from the tribute pool with these phenotypes. Based on her phenotypes, genetic testing has been performed and the perfect mother has already been selected. Based on their phenotypes, three male victors have been chosen as potential candidates to be the father. Your job is to select the father that will guarantee a tribute will ALL the desired characteristics.

dark features = dominant (F) light features = recessive (f)

normal intelligence = dominant (I) above-average intelligence = recessive (i)

normal body type = dominant (B) athletic body = recessive (b)

mother's characteristics: dark features (Ff), athletic body type (bb), above-average intelligence (ii)

potential father A: dark features (Ff), normal body type (BB), above-average intelligence (ii)

potential father B: dark features (FF), normal body type (BB), normal intelligence (II)

potential father C: light features (ff), athletic body type (bb), normal intelligence (Ii)

1. Using the information provided, what are the desired phenotypes for the offspring?

... for features? _____

... for intelligence? _____

... for body type? _____

2. What are the potential genotypes for the desired phenotypes of offspring?

... for features? _____

... for intelligence? _____

... for body type? _____

3. Which father do you think should be chosen as the candidate? Write a hypothesis for your prediction.

_____

_____

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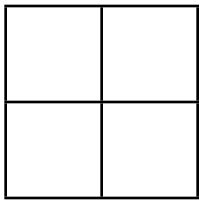
4. Solve the Punnett squares to determine the probability that the offspring will have all of the desired phenotypes of a winning tribute.

Father A

genotype	*phenotype*
Ff	dark features
BB	normal body
ii	above average intelligence

Mother

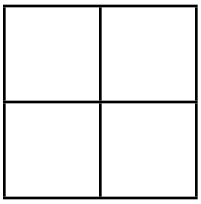
genotype	*phenotype*
Ff	dark features
bb	athletic body
ii	above average intelligence



probability of inheriting...

dark features: _____ %

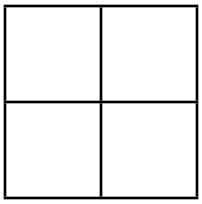
light features: _____ %



probability of inheriting...

normal body: _____ %

athletic body: _____ %



probability of inheriting...

average intelligence: _____ %

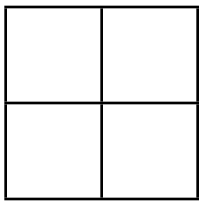
above-average intelligence: _____ %

Father B

genotype	*phenotype*
Ff	dark features
BB	normal body
II	normal intelligence

Mother

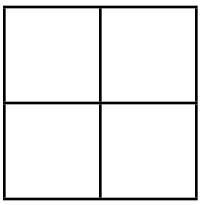
genotype	*phenotype*
Ff	dark features
bb	athletic body
ii	above average intelligence



probability of inheriting...

dark features: _____ %

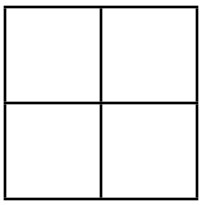
light features: _____ %



probability of inheriting...

normal body: _____ %

athletic body: _____ %



probability of inheriting...

average intelligence: _____ %

above-average intelligence: _____ %

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Father C

genotype	*phenotype*
ff	light features
bb	athletic body
Ii	normal intelligence

Mother

genotype	*phenotype*
Ff	dark features
bb	athletic body
ii	above average intelligence

probability of inheriting...

dark features: _____ %

light features: _____ %

probability of inheriting...

normal body: _____ %

athletic body: _____ %

probability of inheriting...

average intelligence: _____ %

above-average intelligence: _____ %

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5. Which is the father that should be chosen? _____

6. Use evidence from the Punnett squares, and your own reasoning, to support your choice.

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