









## On your Own

- 1.1 How many copies of genome-length DNA would be in a nucleus in a typical human cell?
- 1.2 Which attribute do all these relatives have in common? Aunt Dorothy knits sweaters. Uncle Chester is a dentist. Cousin Charlie builds models. Aunt Martha decorates cakes at a bakery. Uncle Pete repairs sewing machines.
- 1.3 Why might thin lips and small eyes not show up in every generation?
- 1.4 Identical twins share nearly identical inherited characteristics. How could you come to valid conclusions about nature and nurture by studying groups of identical twins?



William and Andrew are identical twins. Or is it Andrew and William?

## Project 1.1: Nature Versus Nurture

Some famous families have striking natural abilities. Karl Wallenda was born into a family of German circus tightrope walkers. He began performing on the tightrope at age 6. He and his family performed daring stunts all over Europe. In 1928, they came to the United States to perform in New York, but the safety net they used was lost in the journey. They performed anyway, without a net, and the crowd was awestruck. Wallenda's children and grandchildren, and later their spouses, joined Ringling Bros. and Barnum & Bailey Circus. They became known as The Flying Wallendas and continued to work without a net. Unfortunately, many family members died or were injured in falls in their daring performances through the years. Karl Wallenda seemed immortal until he died from a fall at age 71. His great-grandson, Nik, continued the family legacy and became the first aerialist to cross the widest part of Niagara Falls on a tightrope in 2012 and the Grand Canyon in 2013.

You could argue that there was some nature but lots of nurture in the Wallenda family circus act. After all, what family do you know who has their 6-year-old walking a high rope in the back yard? Certainly, the opportunity to learn the family trade from the best in the business and to perform at an early age contributed to the Wallenda family's success. Yet the Wallendas have undeniable natural gifts in physical balance and emotional daring.

### This is a research project.

#### 1. Investigate one of the following families.

Music: Johann Sebastian Bach and his father, uncles, and sons

Music: Brothers Ira and George Gershwin

Vocal talent: Nat King Cole and daughter Natalie Cole

Football: Archie Manning and his sons, Peyton, Eli, and Cooper

Baseball: Brothers Matty, Felipe, and Jesús Alou, and Felipe's son, Moisés

Medicine: William Worrall Mayo and his sons, who founded the Mayo Clinic

Writing: Sisters Anne, Emily, and Charlotte Brontë

Writing: Screenplay writers Carl Reiner and son Rob Reiner

Acting: Tony Curtis and daughters Jamie Lee Curtis and Kelly Curtis

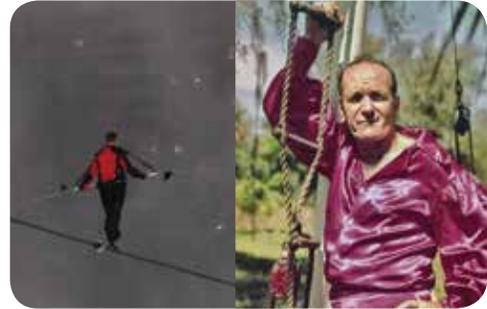
Acting: Kirk Douglas and sons and grandson

Acting: Henry Fonda and children Peter and Jane Fonda

Car racing: Brothers Jerry, Bobby, and Al Unser, and Al's son Al

Other: Another famous family of interest to you, or a family among your friends and acquaintances with an unusual natural ability

### Nik Wallenda Crossing Niagara Falls, Karl Wallenda



Nik Wallenda is Karl Wallenda's great-grandson. The State of New York insisted upon the safety cable behind him.





## Project 1.2: A Quick Temperament Test

Select the answer that best completes the thought for you, and record that letter in the “Your 1st Choice” column found on the next page. Next, record your second-choice answer in the “Your 2nd Choice” column. Think quickly, without analyzing which answer is most socially acceptable. No answer is wrong.

1. After shopping at the grocery store, I naturally
  - a. put my cart away, after the cars driving in the parking lot are safely past and others who are headed for the cart corral have finished.
  - b. put my cart away and feel like encouraging other shoppers to put theirs away too.
  - c. put my cart away neatly, shoving the other carts deeper into the corral so they are lined up better.
  - d. put my cart away and look around to see if anyone I know is nearby.
  
2. If I didn't put the cart away, it was because
  - a. I saw a friend, started a conversation, and forgot the cart.
  - b. the cart corral was overflowing—but I did park it near the cart corral.
  - c. the cart corral was too far away and I was in a terrible hurry.
  - d. No! I will always put my cart away, even if I am the only one doing it.
  
3. I am a member of an organization, and its president has invited me to give a speech to the group. My first thought is,
  - a. “I'll write out my speech and then memorize it so I can deliver it perfectly.”
  - b. “I think I can do a good job for them.”
  - c. “I'll work on the speech, but I am really concerned about what I am going to wear.”
  - d. “That president needs to ask someone else to do the speech.”
  
4. My church needs a volunteer to teach the rowdy third-grade Sunday school class for a couple of weeks. I accept because
  - a. it sounds like fun.
  - b. I like a challenge.
  - c. I might be able to do something creative with them.
  - d. these kids need someone who cares.
  
5. A close friend of the family dies. I will offer to help the grieving family by
  - a. organizing meals or work projects to meet their needs.
  - b. writing a thoughtful, compassionate note and sending it.
  - c. listening on the phone patiently when one of the grieving family members calls me.
  - d. going to the house, visiting the family, and having short conversations with everyone.
  
6. Fall has buried my back yard in leaves that must be raked. I start raking, thinking,
  - a. “This work is a small price to pay for the grandeur of seasonal change.”
  - b. “Instead of raking, maybe I could blow the leaves into the woods with a snowblower or mow over them to break them up.”
  - c. “I don't like doing this by myself. I'll invite friends over for a raking party.”
  - d. “Do we really have to rake this year? If I put off raking for a few days, maybe the wind will blow the leaves into the woods.”

7. I have done so well in an online class I am taking that no matter how I score on the final exam, my grade will not go down. I will
- skip the test and read a good book, work out, or spend time on another class.
  - take the test anyway and study with the same effort I used on the other exams because it's the principle of the thing.
  - take the test anyway, but I won't waste much time studying for it.
  - skip the test and hang out with friends to celebrate.
8. Someone startles me out of my skin by suddenly calling out to me when I walk past in the dark. I jump
- and then feel angry and want to tell him off.
  - but don't say much and I soon forget about it.
  - but then smile and enjoy the surprise and the attention.
  - and then worry about what others think about my reaction.
9. My family has invited several other families over for an evening of games. I help by offering to
- welcome the guests as they arrive.
  - clean before the party and then get out of the way.
  - plan where everyone will park, which games we will play, and how the yard should be set up for those games.
  - decorate or make food.
10. The local Christian radio station offers a prize to someone selected at random, and my name has been chosen. The prize I would be interested in is
- a complete collection of works by an author I've wanted to read.
  - a white-water rafting trip for me and 3 friends.
  - a season ticket to the local symphony or a season pass to an art museum.
  - an all-expenses-paid trip to help my favorite athlete or musician do relief work after a tornado.

### ANALYSIS OF YOUR RESPONSE

Your first- and second-choice answers reflect your temperament. Using the key, write the initial for the temperament next to your choice in the Temperament Test table.

Study example 1.1 to learn how to score your answers. Then calculate the points for your response and record your dominant and secondary temperaments.

### Temperament Test

| Question | Your 1st Choice Answer | Initial (from Key) | Your 2nd Choice Answer | Initial (from Key) |
|----------|------------------------|--------------------|------------------------|--------------------|
| 1        |                        |                    |                        |                    |
| 2        |                        |                    |                        |                    |
| 3        |                        |                    |                        |                    |
| 4        |                        |                    |                        |                    |
| 5        |                        |                    |                        |                    |
| 6        |                        |                    |                        |                    |
| 7        |                        |                    |                        |                    |
| 8        |                        |                    |                        |                    |
| 9        |                        |                    |                        |                    |
| 10       |                        |                    |                        |                    |

### Key to the Temperament Test

| Question | Your Answer |    |    |    |
|----------|-------------|----|----|----|
|          | a.          | b. | c. | d. |
| 1        | P           | C  | M  | S  |
| 2        | S           | P  | C  | M  |
| 3        | M           | C  | S  | P  |
| 4        | S           | C  | M  | P  |
| 5        | C           | M  | P  | S  |
| 6        | M           | C  | S  | P  |
| 7        | C           | M  | P  | S  |
| 8        | C           | P  | S  | M  |
| 9        | S           | P  | C  | M  |
| 10       | P           | S  | M  | C  |

Use the key to record the initial of the temperament that corresponds to your first- and second-choice answers.

**EXAMPLE 1.1**

One person's first-choice answers were 1. P, 2. M, 3. M, 4. P, 5. P, 6. S, 7. P, 8. M, 9. C, 10. P. This person had 5 P answers and 3 M answers. We would give a point to each P and M and ignore the C and the S because they each appear only once.

This respondent's second-choice answers were 1. M, 2. C, 3. P, 4. S, 5. M, 6. P, 7. M, 8. P, 9. P, 10. M. This person had 4 Ps and 4 M answers. We would give each of these second-choice letters a half point.

The respondent for this test has 7 points for phlegmatic and 5 points for melancholic. We can assume she has a dominant phlegmatic temperament, with a secondary temperament that is melancholic.

Your dominant temperament will probably generate the most points. The letter generating the second-highest number of points is probably your secondary temperament.

**My Dominant Temperament****My Secondary Temperament****CONFIRM YOUR RESULTS**

Now let's confirm your answers. Have someone who knows you well take the quick test, answering how *you* would answer. Score the test. Did these new responses indicate the same dominant temperament that yours did?

Confirmation from a secondary source agrees or disagrees with my findings.

Another way to confirm your dominant temperament is to remember your gut reaction when you first read that you would take this test. If you initially thought it looked like fun, you are probably sanguine. If you naturally feel analyzing yourself is a waste of time, you are probably phlegmatic. After taking the test, if you felt the desire to contest some of the answers, you are probably choleric. If you wanted to retake the test and make suggestions about word choice, you could be melancholic.

My gut reaction agrees or disagrees with my findings.

For a surefire confirmation of temperament, look at the strengths and weaknesses for each temperament listed in your textbook's figure 1.9 (adapted from Bennett and Bennett [2005], LaHaye [1991], and Men's Fraternity [2006]). Don't try to memorize these lists. Instead, form a picture in your mind of the kind of person who matches each temperament.

Do you identify with a group of useful strengths? Even more important are the weaknesses. It can be painful to see and admit your weaknesses, and yet a weakness is not a prison sentence. You are not an animal, subject to the whims of your temperament. You have free will to act as you wish. It is helpful to know that when you are tired or discouraged, your weaknesses may become more apparent to people around you. Admit that you have weaknesses, and then do what you can to keep them from hurting other people.

The descriptions agree or disagree with my findings.

## Project 1.3: Building on Temperament Strengths & Weaknesses

- Review your temperaments test page once more. Using your textbook's figure 1.9 as a word bank for your dominant temperament, list 5 strengths and 5 weaknesses you see in yourself.

### My Strengths

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### My Weaknesses

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- Look at figure 1.9 again. This time list 2 strengths and 2 weaknesses from your *secondary* temperament.

### My Secondary Strengths

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### My Secondary Weaknesses

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- For this part of the self-analysis, look at the 4 temperaments in figure 1.9, and then choose 8 strengths that you do not see in yourself but would like to develop. The strengths can be from any temperament. Would you like to be calm under pressure? Would you like to be more excellent in your work?
- List those 8 strengths in the appropriate column. In the second column list 8 people you know with those particular strengths. In the third column come up with an action step you could take in your life to develop each characteristic. In the last column record the date you accomplish the action step below.

For instance, if you are sanguine with a tendency to waste money, the phlegmatic person's thrift might help you. Or maybe you lack confidence in front of people. You might write something like this:

| Strength     | Person         | Action Step  | Date |
|--------------|----------------|--|------|
| Thrift       | my friend, Joe | ask how he got such a good deal on that laptop                                     |      |
| Confidence   | Aunt Barb      | ask what she thinks about when she does public speaking                            |      |
| Thoroughness | my brother     | go through my math problems twice like he does                                     |      |
| Spontaneity  | youth pastor   | keep Sunday evenings free so I can get together with others from my church for fun |      |

Put the date on the far right each time you accomplish one of these action steps.

| Strength | Person | Action Step | Date |
|----------|--------|-------------|------|
|          |        |             |      |
|          |        |             |      |
|          |        |             |      |
|          |        |             |      |
|          |        |             |      |
|          |        |             |      |
|          |        |             |      |
|          |        |             |      |
|          |        |             |      |



## On Your Own

### 1.5 Which 2 temperaments are happiest about a party tonight?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.6 Which 2 temperaments would rather curl up with a good book than be with people at a party?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.7. Which temperament, because of self-confidence, probably struggles most with pride?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.8. Which 2 temperaments can get so involved with projects that they put relationships on the back burner?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.9 Which temperament, because of perfectionism, has the hardest time taking criticism?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.10 Which temperament looks at every task and measures how much energy and money it will take to finish the task?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.11 Which temperament charges into a task without concern for how much work or time is involved and tends not to finish?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.12 Which temperament has the most patience with children?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.13 Which temperament is optimistic and tends to see the good side of things?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.14 Which temperament is pessimistic and tends to imagine the worst?

Choleric      Sanguine      Melancholic      Phlegmatic

### 1.15 Which temperament charges into any group of people and tends to lead it?

Choleric      Sanguine      Melancholic      Phlegmatic

## Project 1.4: My Natural Preferences

As you read through your textbook, record your natural preferences here.

### My Laterality

Dominant hand (circle one):    right    or    left

Dominant foot (circle one):    right    or    left

Dominant eye (circle one):    right    or    left

If not all the same, I am cross-dominant, with opposite laterality in my \_\_\_\_\_.

### My Circadian Rhythm

I am a (morning or night) person.

I usually get about \_\_\_\_\_ hours of sleep each night.

The most difficult part of the day for me is \_\_\_\_\_.

I deal with this part of the day by \_\_\_\_\_.

### My Food Preferences

Breakfast: \_\_\_\_\_

Lunch: \_\_\_\_\_

Snack: \_\_\_\_\_

Dinner: \_\_\_\_\_

### How I Relax

\_\_\_\_\_  
\_\_\_\_\_

### My Average Daily Minutes of Challenging Physical Activity

\_\_\_\_\_ minutes

\_\_\_\_\_

*I think about this.*



## Study Guide

### Review Questions

1. Briefly define *nature* and *nurture*, and give 2 examples of each.

**nature:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**examples:** \_\_\_\_\_

\_\_\_\_\_

**nurture:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**examples:** \_\_\_\_\_

\_\_\_\_\_

2. Health is balance in a realm of life. Briefly, what does health in each realm look like?

**physical:** \_\_\_\_\_

\_\_\_\_\_

**social:** \_\_\_\_\_

\_\_\_\_\_

**mental:** \_\_\_\_\_

\_\_\_\_\_

**emotional:** \_\_\_\_\_

\_\_\_\_\_

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**spiritual:** \_\_\_\_\_

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3. Your genetics were given to you by your biological parents at conception. Fill the blanks in the paragraph below with the letter from the correct term in the box:

Characteristics a person displays are called \_\_\_\_\_. \_\_\_\_\_ is the study of these characteristics passed from generation to generation. The information for these is found on structures called \_\_\_\_\_, which are visible at the time of cell duplication, when they are wound up tightly. These structures are long, twisted fibers of \_\_\_\_\_ with protective coating. Each fiber contains a sequence of many \_\_\_\_\_. The choice of a base and the order in which the bases appear form a language. The language carries the information needed to make \_\_\_\_\_, which is how the characteristic is expressed. A section of this fiber that codes for a specific characteristic is called a \_\_\_\_\_. All the information on the genetic structures that codes specifically for your traits is your \_\_\_\_\_.

- |                                |                         |
|--------------------------------|-------------------------|
| a. chromosomes                 | e. genotype             |
| b. deoxyribonucleic acid (DNA) | f. nucleobases or bases |
| c. gene                        | g. proteins             |
| d. genetics                    | h. traits               |

4. Because you have 2 parents, you have 2 copies of each gene on homologous pairs of chromosomes. If you have a dominant gene and a recessive gene for the same trait, which one will be expressed?

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5. What is the only situation in which a recessive gene is expressed?

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6. What is one good reason to be aware of the diseases in your family that are known to be hereditary?

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7. What is one good reason to be aware of abilities and talents in your family that seem to be hereditary?

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8. Identify the 4 temperaments described:

a. \_\_\_\_\_ “I need time alone. I value honesty, thriftiness, promptness, and quiet. I love children. People call me steady. I hold back from expressing my opinions.”

b. \_\_\_\_\_ “I seem to rise to leadership every time I enter a group of people. I have been called bossy and occasionally I lose my temper, but I say what I think and have confidence that I can accomplish the task.”

c. \_\_\_\_\_ “I never met a stranger. People say I am energetic and fun-loving, but I forget details sometimes, especially when I see someone I know. I love to try new things.”

d. \_\_\_\_\_ “I never measure up to what I envision I could be. I have been told I am thorough and precise, and I am moved emotionally by excellent drama or music. I love a creative project.”

9. If you are not strongly one of the 4 temperaments, what could be complicating your temperament?

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10. What is the difference in laterality among dominant, mildly dominant, cross-dominant, and ambidextrous people? What 2 things can make true laterality harder to determine?

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11. What does it mean to be diurnal? To be nocturnal? Are humans naturally nocturnal?

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12. Give 2 characteristics of a morning person and 2 characteristics of a night person.

**morning person:** \_\_\_\_\_

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**night person:** \_\_\_\_\_

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13. What is an omnivore?

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Answers to this Study Guide are found online on your book extras page. When you feel confident that you have mastered the materials in this module, you can find the exam at the back of this notebook. Your parent or teacher will grade your exam.