FLINN SCIENTIFIC

Name_____

WQI Student Data Table

Test Site Information

Location: _____

Date/Time: _____

Weather:_____

Field Data and Calculations

Test	Calculations/Measurements	Final Data
Dissolved Oxygen	DO measured = _____ ppm Atm Pressure: _____ mm Hg Correction Factor = _____ DO correction calculation: Corrected DO = _____ ppm	% Saturation =
Phosphate	n/a	ppm
Nitrates	n/a	ppm
pH	n/a	
Δ Temperature (3 groups only)	Water temp location 1 = _____ ºC Water temp location 2 = _____ ºC Δ Temp calculation using class median temps:	° C
Turbidity (5 groups only)	Depth when Secchi disk first disappears = _____ ft _____ inches Depth when Secchi disk reappears = _____ ft _____ inches Average depth calculation	___ feet ___ inches

Lab Data and Calculations

3-day Fecal Coliform	Total mL of water sample added to the positive tubes = _____ mL Total mL of water sample added to all tubes = _____ mL MPN calculation:	colonies per 100 mL
Total Solids	Mass of clean, dry beaker = _____ g Mass of beaker with "total solids" = _____ g Mass of residue = _____ g Total volume of water added (mL) _____ + _____ + _____ + _____ + _____ = _____ mL Total Solids Calculation:	ppm
5-day BOD	5-Day DO measured = _____ ppm Atm Pressure: _____ mm Hg Correction Factor = _____ DO correction calculation: Corrected DO = _____ ppm 5-day BOD calculation using class median DO and 5-day DO.	ppm

Name_____

WQI Student Calculation Page: Determining the Water Quality Index

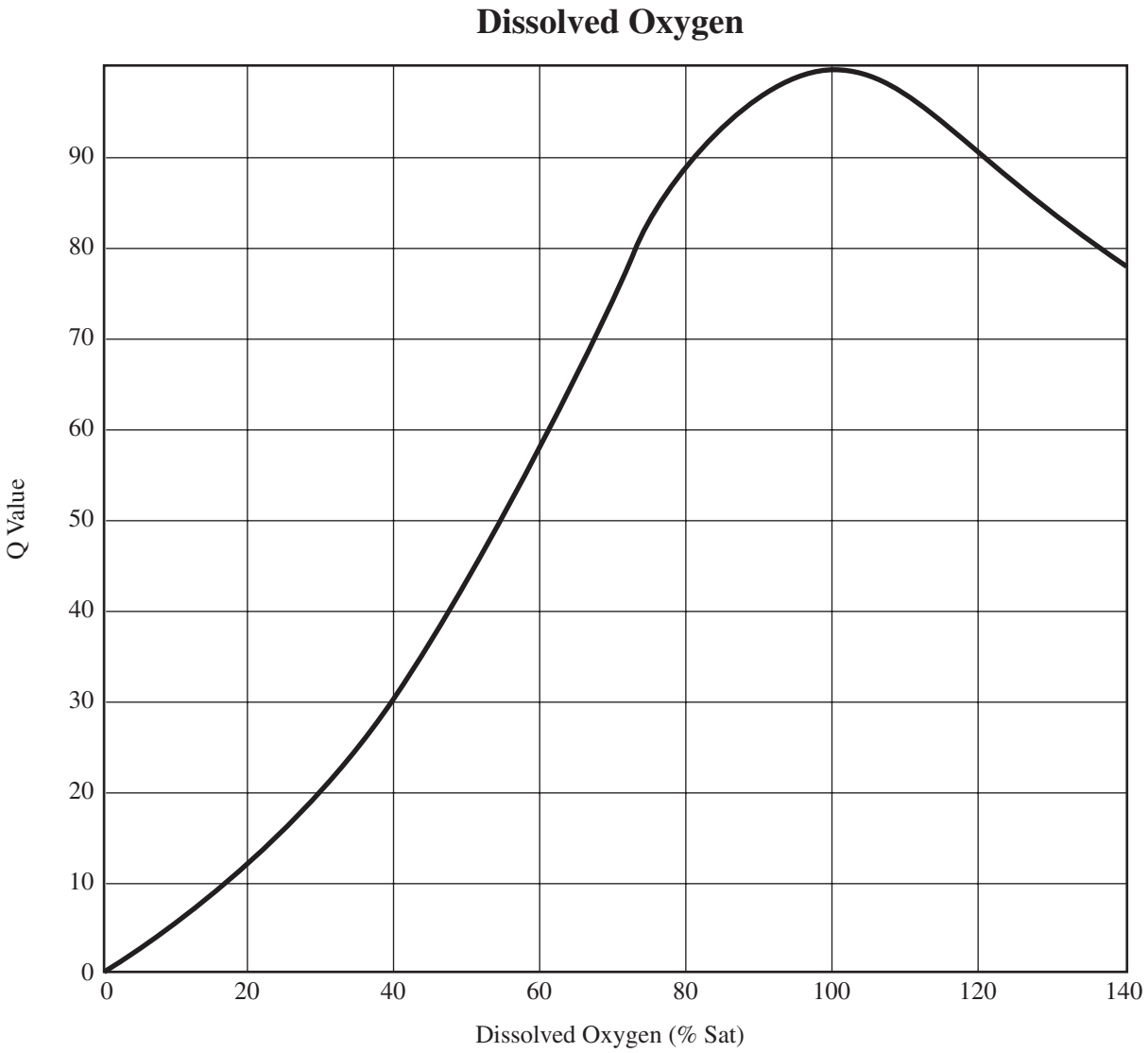
To calculate the WQI for the river or lake tested, the Q-values for each of the nine tests must be calculated using the class median data values. Multiply each Q-value by the weighting factor shown below. Tests with a high weighting factor have a greater influence on determining the overall water quality of a lake or river.

After all the Q-values have been multiplied, add up the values that result from each of the nine tests to get the overall water quality index.

WQI Calculation Chart

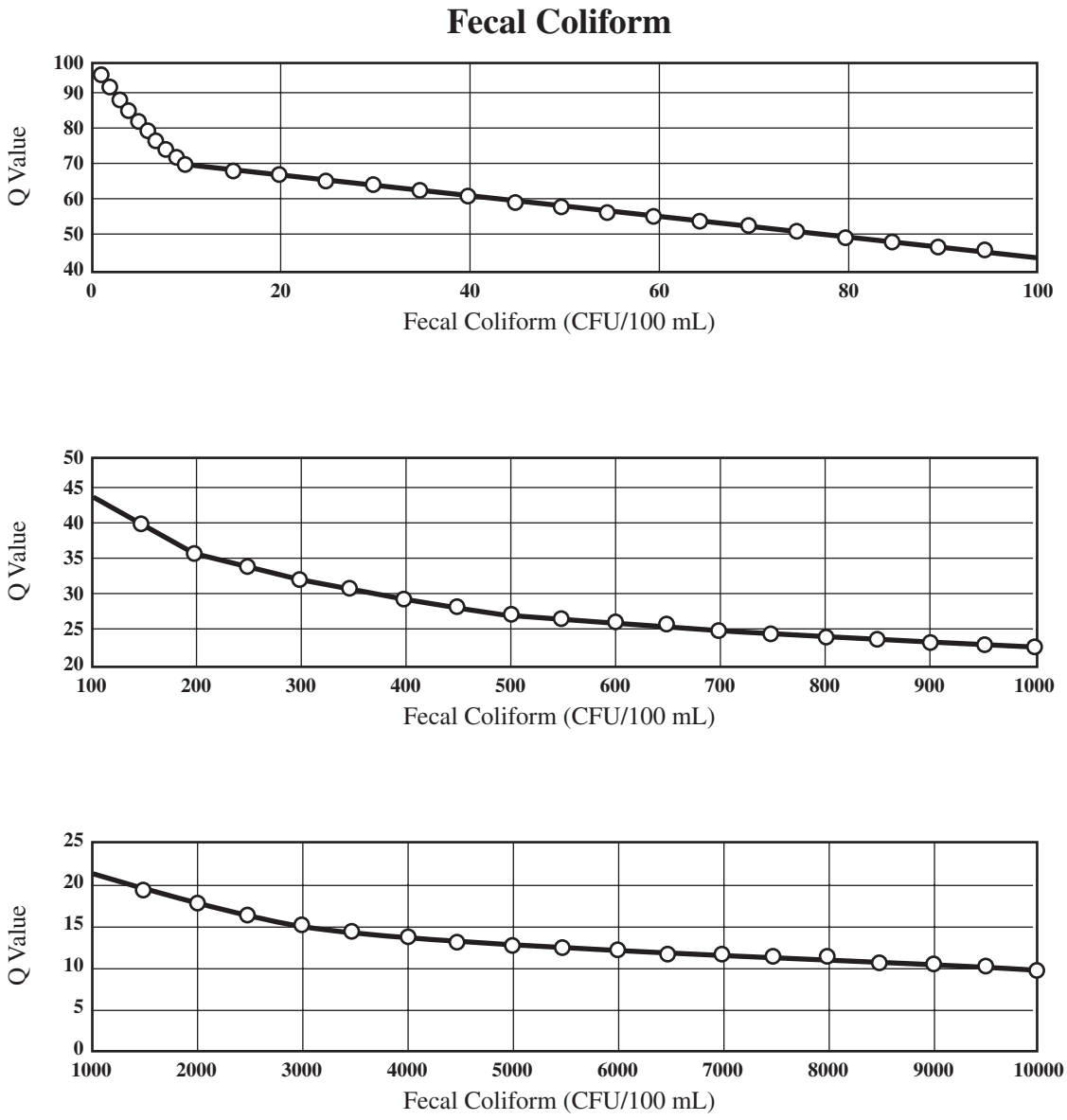
Test	Class Median Test Results	Q-Value	Weighting Factor	Total
1. DO	% saturation		0.17	
2. Fecal coliform	col/ 100 mL		0.16	
3. pH			0.11	
4. BOD	ppm		0.11	
5. Temperature	°C		0.10	
6. Total Phosphate	ppm		0.10	
7. Nitrates	ppm		0.10	
8. Turbidity	ft inches		0.08	
9. Total Solids	ppm		0.07	
Q-Values and WQI Ranges 90–100 = Excellent 70–90 = Good 50–70 = Medium 25–50 = Bad 0–25 = Very Bad				WQI =

Water Quality Index Q-Value Charts
Chart 1: Dissolved Oxygen (DO) Test Results



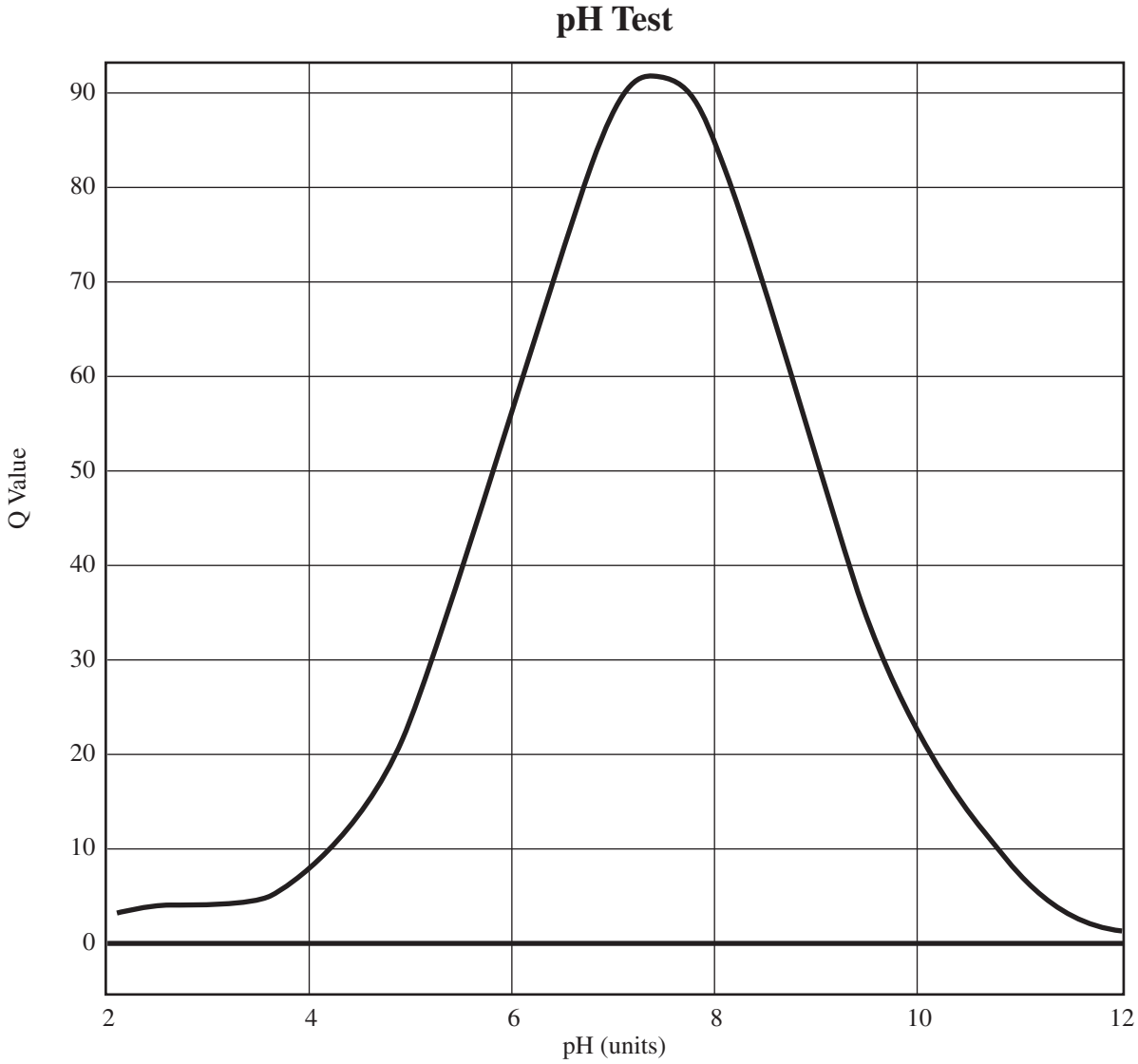
Note: If DO % saturation >140, Q = 50.0

Water Quality Index Q-Value Charts
Chart 2: Fecal Coliform (FC) Test Results



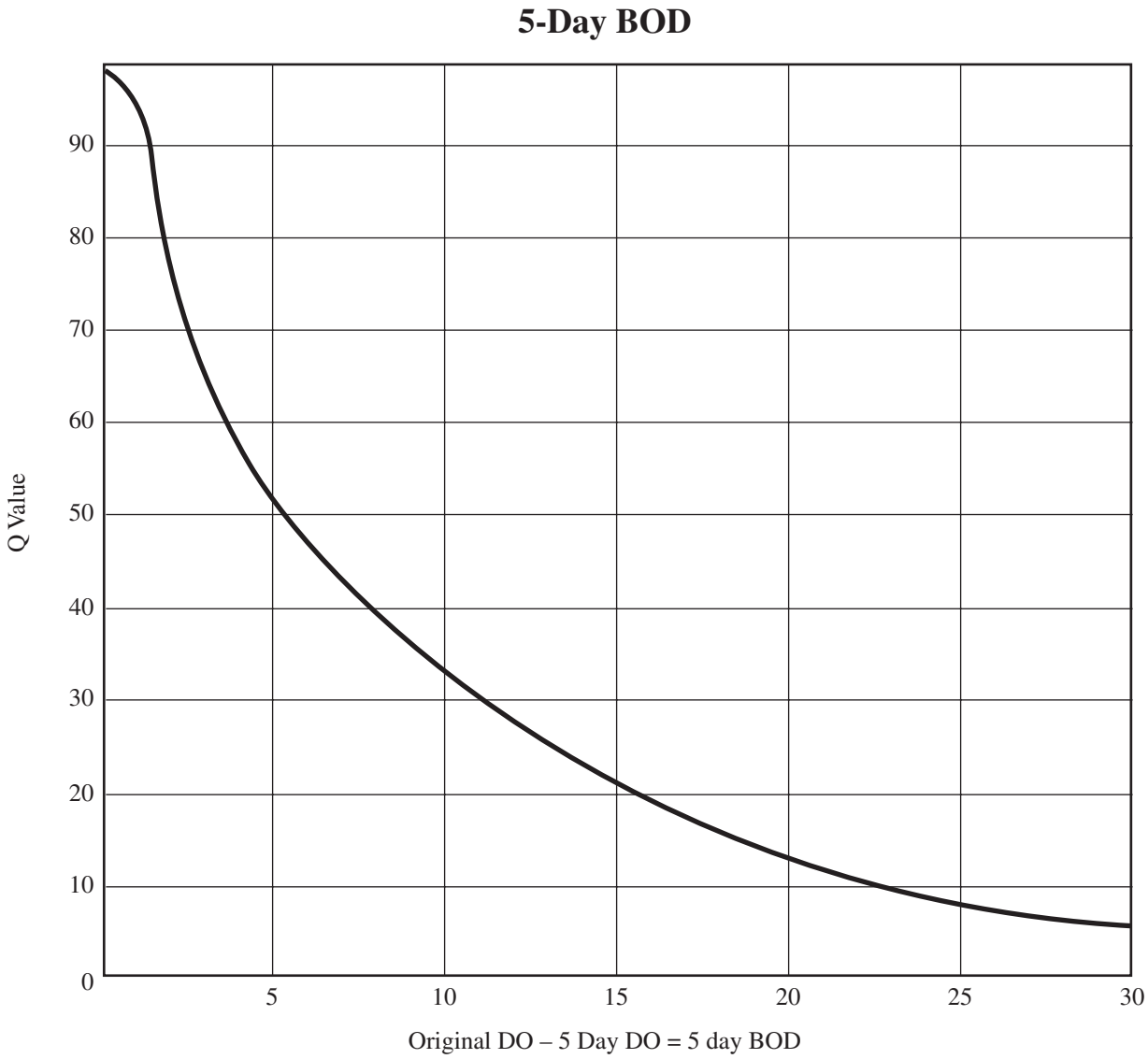
Note: If FC >10,000, Q = 2.0

Water Quality Index Q-Value Charts
Chart 3: pH Test Results



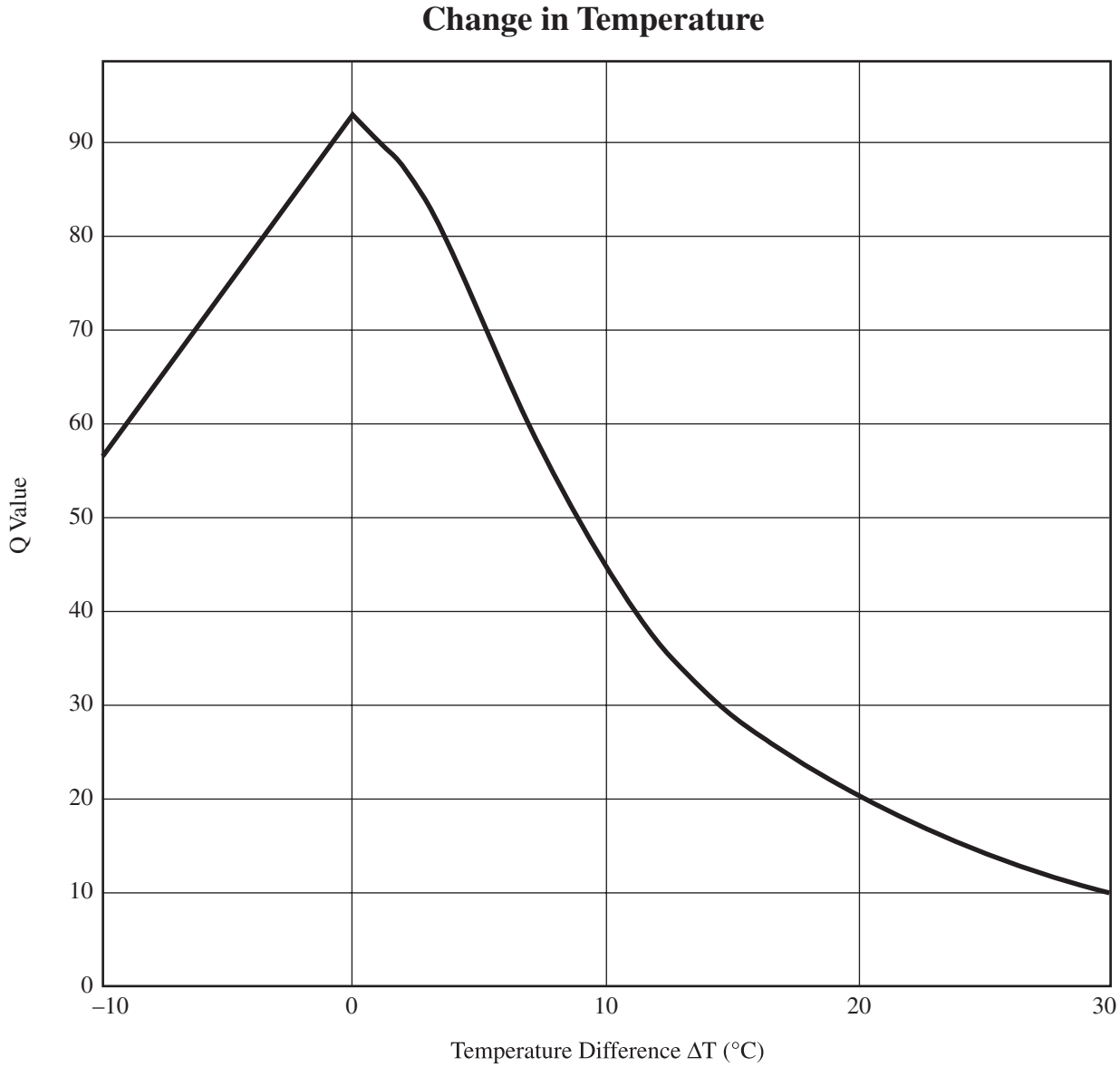
Note:
If pH <2.0, Q = 0.0
If pH >12.0, Q = 0.0

Water Quality Index Q-Value Charts
Chart 4: Biochemical Oxygen Demand (BOD5) Test Results

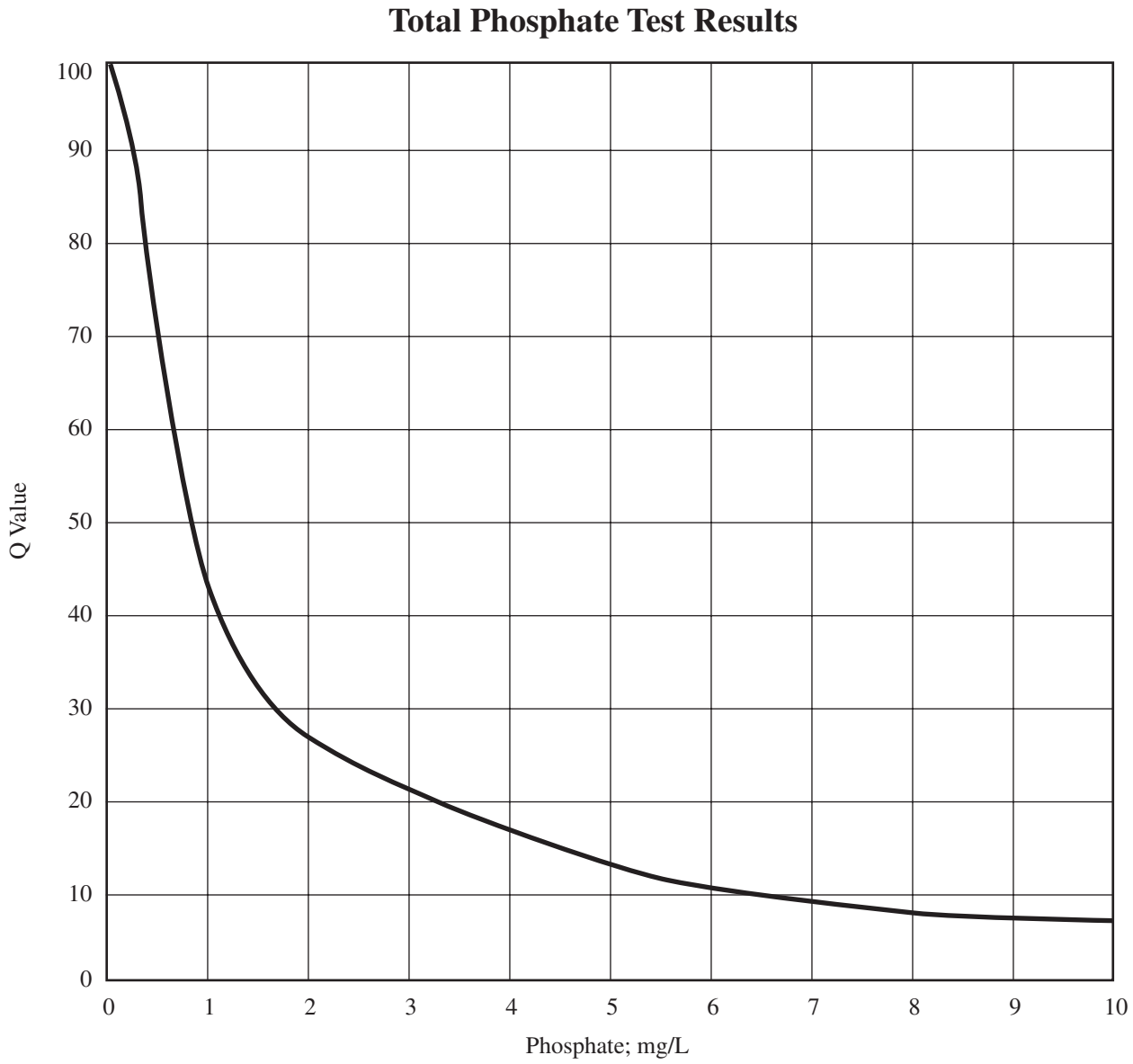


Note: If 5 day BOD >30.0, Q = 2.0

Water Quality Index Q-Value Charts
Chart 5: Change in Temperature (ΔT, °C) Test Results

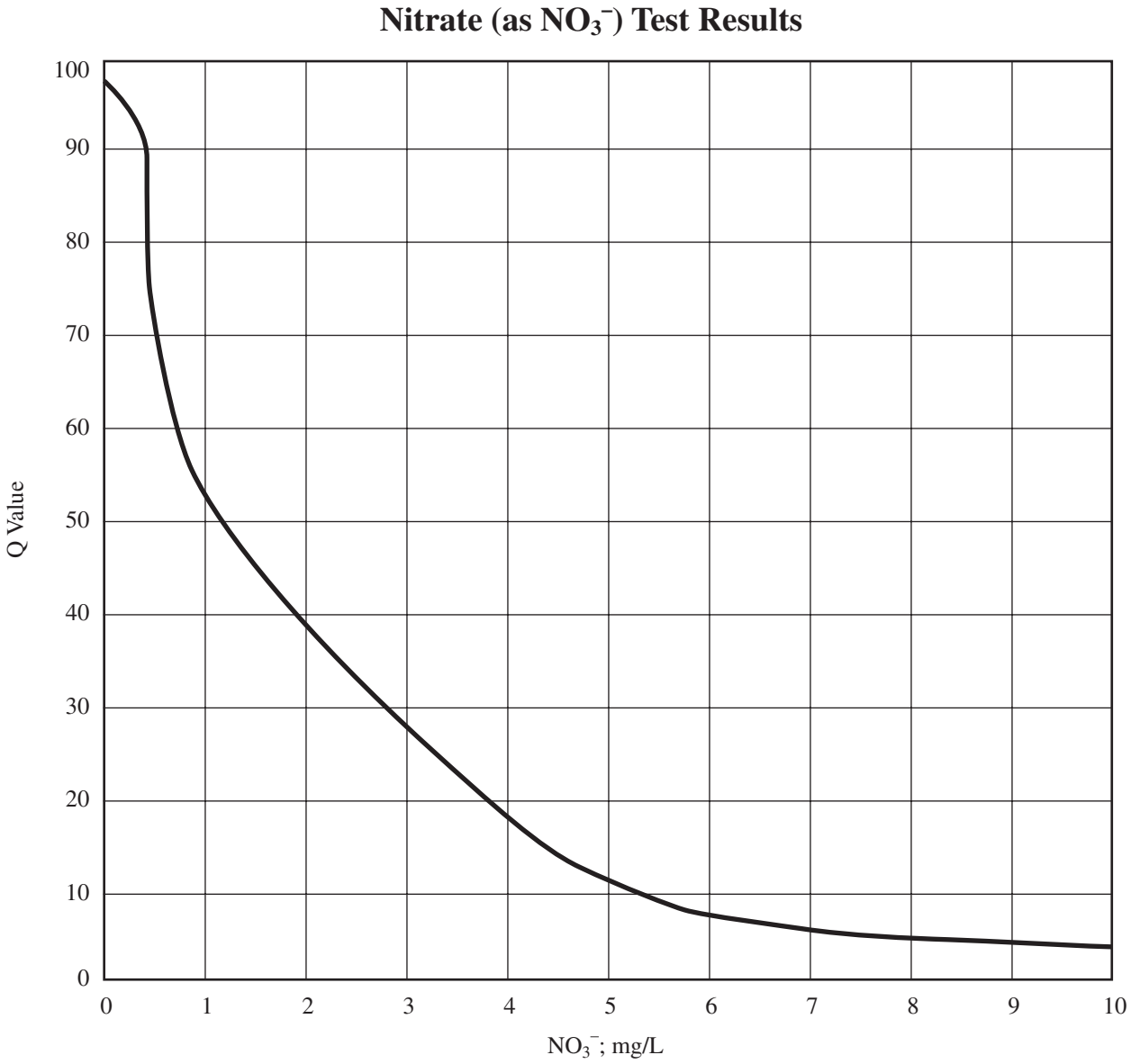


Water Quality Index Q-Value Charts
Chart 6: Total Phosphate Test Results



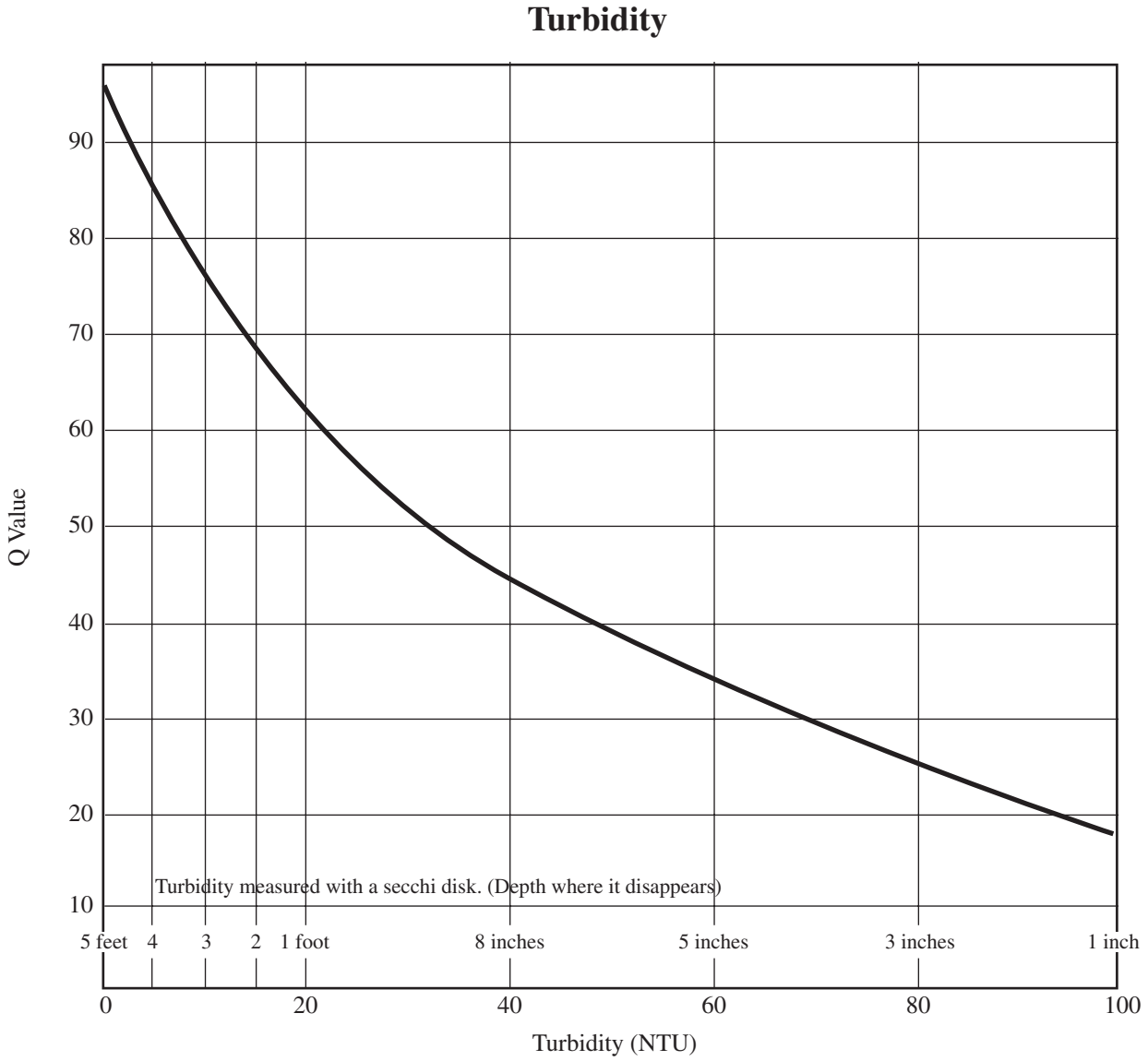
Note: If PO_4^{-} >10.0, Q = 2.0

Water Quality Index Q-Value Charts
Chart 7: Nitrate (as NO3–) Test Results



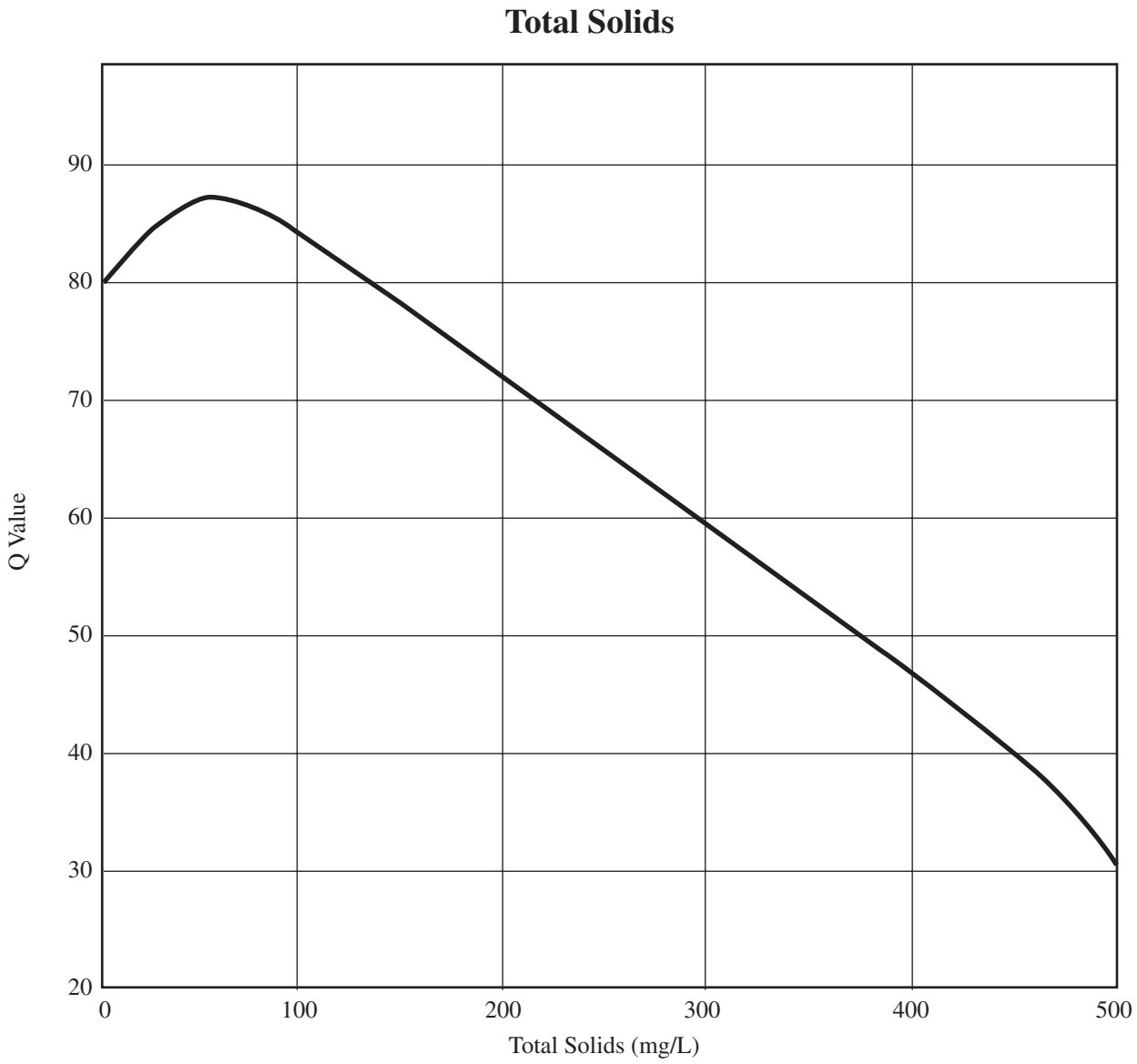
Note: If NO_3^- >100.0, Q = 1.0

Water Quality Index Weighting Curve Charts
Chart 8: Turbidity Test Results



Note: If turbidity >100 NTUs, Q = 5.0

Water Quality Index Q-Value Charts
Chart 9: Total Solids (TS) Test Results



Note: If TS >500.0, Q = 20.0

Name_____

Critical Thinking WQI Questions Worksheet

1. Which test is the most difficult? Why?

2. Which test has the greatest chance of having a large experimental error? Explain?

3. Which test is weighted the most heavily when determining the Q-value of the water? Why do you think so much importance is placed on this test result?

4. Which test is weighted the least heavily when determining the Q-value of the water? Why do you think so little importance is placed on this test result?

5. What was the biggest difference in the data when you compared the data from the stationary lake to the moving water? (Make sure to explain how you quantified "the biggest difference." If a lake and river were not tested, which test do you predict would show the biggest difference?)

6. Are biotic (living) or abiotic (non-living) factors the main influence on the quality of the water tested? Describe the evidence for your answer!

7. Choose one water quality parameter tested. What could be done to the environment to improve the Q-value of this parameter?

8. Which parameter tested should be of the greatest concern to the public? Why?

9. Which parameter tested should be of the least concern to the public? Why?