G. W. Carver Center for the Arts and Technology

938 York Road
Towson, MD 21204

Building & Construction Technology

2024-2025 Assessment Guidelines

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Eligibility

Applications must be submitted on or before 1 p.m. on Friday, November 3, 2023. Applications can be accessed from the BCPS Magnet Programs' Web site (www.tinyurl.com/BCPSMagnet) beginning at 12:00 noon on Tuesday, September 12, 2023. Late applications are not processed.

Applicants must attend and complete the assessment for the program to which they applied. Failure to do so will disqualify the applicant; and admission into the magnet program will be denied.

Applicants may only assess for the program(s) to which they applied. Assessments completed for a program not selected on the application will not be scored.

Documented testing accommodations, as appropriate to the assessment, will be provided. Education plans for students not currently attending a BCPS school must be submitted with the magnet application.

Assessment Scheduling

Assessments must be scheduled through the online application system when the application is submitted.

Failure to attend an assessment WILL result in disqualification.

If there are scheduling conflicts with other magnet assessments, parents must contact the Magnet Programs' office by no later than November 8, 2023.

It is the responsibility of the parent(s) to:

- ensure the applicant attends the assessment on the scheduled date and time.
- ensure the applicant brings the required materials to the assessment.
- contact the schools immediately if an unforeseen illness or emergency occurs.

Unforeseen Illness or Emergency: If the applicant cannot attend or complete the scheduled assessment due to an unforeseen illness or emergency, **please immediately contact G. W. Carver Center for the Arts and Technology at (443) 809-2793.** Please be aware that assessments will not be rescheduled without documentation verifying the illness or emergency. Documentation must be provided to the school within 72 hours of the illness or emergency.

Inclement Weather: If school activities are cancelled due to inclement weather, magnet assessments will be postponed. Postponed assessments will occur on the designated inclement weather date. All emergency closing and cancellation information will be posted on the BCPS automated information line, (443) 809-5555. Closings and cancellation announcements may also be made through local media.

Academic Integrity

By taking the BCPS magnet assessments, applicants agree NOT to participate in any of the following activities. Violation of this agreement may result in disqualification:

- Submitting, copying, or attempting to copy another's work, including plagiarizing another's words or ideas
- Using or attempting to use unauthorized materials and/or technology
- Falsifying information in an academic exercise
- Assisting another in academic dishonesty

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Assessment Overview

Magnet Coordinator(s): Lori Turner lturner2@bcps.org
Maria Tazelaar-Ngo mtazelaar@bcps.org

Assessment Date(s): Saturday, Jan. 13, 2024 @ 8 a.m. – 6 p.m.
Applicants must arrive 15 minutes prior to assessment start time
Inclement Weather Date: Saturday, Jan. 20,2024

Assessments are by appointment only. Assessments must be scheduled by Nov. 8, 2023.

Assessment Duration: 3 hours

Assessment Description: Applicants will complete a math test of approximately 15 questions and a multiple-choice Magnet-related test of approximately 20 questions. They will also write an essay and complete a practicum.

On-Site Registration

- **Arrival:** Report to the Dining Hall 15 minutes prior to appointment time. Late applicants will not be admitted into the assessment.
- **Accompaniment Information:** Parents are asked to drop off applicants and return at the conclusion of the assessment. There is no seating available in the school for parents and parking is limited.
- **What to Bring (see Preparing for the Assessment below for details):**
  - 1 - 3"x5" handwritten index card with essay information

Assessment Components & Self Evaluation

Evaluation Component	Point Values
Essay	Up to 15 pts
Magnet Test	Up to 20 pts
Math Test	Up to 15 pts
Practicum	Up to 50 pts
TOTAL	Up to 100 pts

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Preparing for the Assessment

Applicants will complete a math test of approximately 15 questions and a multiple-choice Magnet-related test of approximately 20 questions. They will also write an essay and complete a practicum.

Essay:
On the day of the assessment, applicants will be asked to write an essay in response to one of the three topics provided below. The essay will be composed and written on-site and will be evaluated on how thoroughly it addresses the topic, using a standard rubric. ***Applicants will be allowed to bring in one 3x5 hand-written note card with information needed to complete their essay. Note cards may not be typed or copied and pasted.*** Essays written in advance will not be accepted.

1. How has the field of carpentry changed over the last 20 years? Particularly, how has the advancement of technology changed the knowledge and skills a carpenter needed then and now?
2. Compare and contrast two different careers in the field of carpentry. How do the skills and knowledge needed to be successful differ and what skills and knowledge needed are the same? Include information about what education is required for each career and what employment opportunities are available.
3. Interview a set designer/carpenter for a high school, college, or community theatrical performance to find out why the set was designed the way it was, how the set was constructed, and what types of skills and knowledge were needed in the construction of the set. Attend a performance in which the set was used. Be prepared to write an essay describing what you learned during the interview and how the set design and props enhanced the performance.

Magnet Test:
Students will take a multiple-choice test of approximately 20 questions centered on a standard carpentry diagram.

Math Test:
Students will take a math test of approximately 15 questions involving fractions, word problems, division, and multiplication. Calculators will be provided. ***Sample questions are provided below.***

Practicum:
Candidates will assemble a small structure without the use of hand tools. This project will give candidates an opportunity to demonstrate evidence of their manual dexterity skills, ability to follow directions, and to determine carpentry interest.

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Sample Math Questions:

Instructions: Addition, subtraction and multiplication are used in practical mathematics in Carpentry for cost estimating and calculating building materials. Solve the following mathematical problems:

Length/Liquid Standard Conversions
1 foot = 12 inches
1 yard = 3 feet
1 quart = 2 pints
1 gallon = 4 quarts
1 pound = 16 ounces

Addition:

1.) 431
212
100
+ 88

2.) 222
363
29
+ 976

Subtraction:

3.) 32,456
- 6,742

4.) 821
- 129

Multiplication:

5.) 564
×2.35

6.) 45.23
x 0.64

7.) .444
× .04

8.) 1.055
x0.632

Conversion: Conversions are used for measuring. Convert the following:

9.) 84 inches = _____feet

10.) 72" = _____'

Division: Decimals functions are used in roof framing. Solve the following:

11.) 2,024.00 ÷ 3

12.) 3,951.00 ÷ 220

Conversion: The measurement of liquids for paints and stains are needed for interior finishes. Convert the following:

13.) 32 gallons =_____quart(s)

Word Problems: Mathematical scenarios that a carpenter may need on construction sites. Solve the following:

14.) At $22.50 per hour, how much money will you earn in 39 ½ hours?

15.) One meter is equal to 3.28 feet. How many feet in 20 meters?

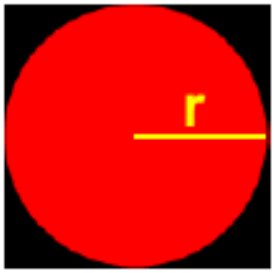
16.) If one kilometer is equal to 0.6 miles how many kilometers would you have traveled if you have traveled 42 miles?

17.) A British Thermal Unit (BTU) is the amount of heat required to raise one pound of water one degree Fahrenheit. How many BTU's would be required to raise 22 pounds of water 16 degrees?

18.) A column of water 2.31 feet high exerts a pressure of one pound per square inch. How much pressure does a column of water 24.20 feet high exert?

19.) In Figure #1, what is the circumference of the circle?
$C = 2 \times \pi \times r$ where $\pi = 3.14$

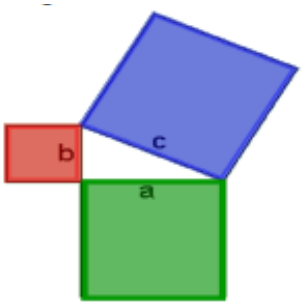
Figure #1 *r = 20˚*



20.) What is the area of Figure #1? $A = \pi \times r^2$ *where* $\pi = 3.14$

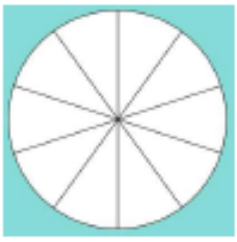
21.) Using the formula $c = \sqrt{a^2 + b^2}$, what is the length of the side c in Figure #2 if a = 12" and b = 6" and c = ?

Figure #2



22.) Geometrical shapes are an intergral part of carpentry layouts. The circle in Figure #3 is divided into 10 equal parts. What is the sum of degrees of all 10 equal parts?

Figure #3



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23.) Algebra is used to find the values of structual loads. Find the value of "*x*" in the following equations:
A. $4x + 10 = 3x + 30$ B. $x - 20 = 30$

Fractions:
Note: Calculating fractions is used for identifying lumber dimensions. Simplify all fractions.

Addition:

24. $6\frac{1}{2}$
$+ 4\frac{1}{8}$

25.) $10\frac{1}{4}$
$+5\frac{1}{3}$

Subtraction:

26.) $8\frac{3}{8}$
$- 4\frac{3}{4}$

27.) 17
$- 6\frac{1}{16}$

Multiplication:

28.) $\frac{1}{4}$ x 38 =

29.) $5\frac{3}{4}$ x $\frac{1}{2}$ =

Division: (write answers in mixed number form)

30.) 22 ÷ $\frac{3}{8}$ =

31.) $\frac{5}{8}$ ÷ $\frac{1}{4}$ =

Addition: Decimals are used in numerous carpentry charts. Solve the following:

32.) 3.2015
0.528
+12.5215

33.) 0.95
23.95
+ 22.751

Subtraction:

34.) 72.645
-2.999

35.) 656.95
-331.62

Multiplication:

36.) 52.92
×0.444

37.) 78.324
x0.18

38.) 0.226
x 200

Division: Express to the thousandths.

39.) 0.20) 5.240

40.) 4.2) 15.6520

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Express as a percentage:

41.) 0.10 =

42.) 0.25 =

Express in decimal form:

43.) 25% =

44.) 125% =

Find the value:

45.) 35% of 250 =

46.) 0.75 of 300 =

47.) 40% of 100 =

48.) In Figure #1 what is the measurement displayed?

Figure # 1

49.) In Figure #2 what is the measurement displayed?

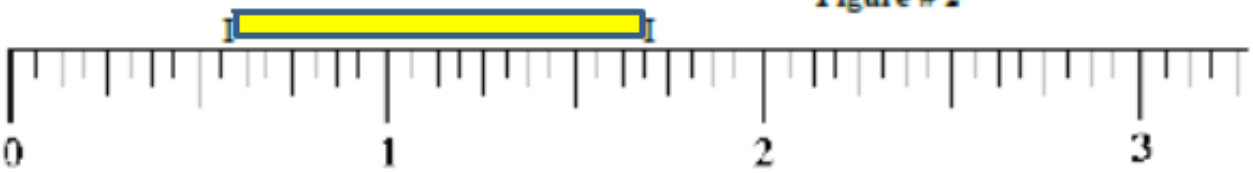

Figure # 2

50.) What is the unit of measurement on this ruler in Figure #3?

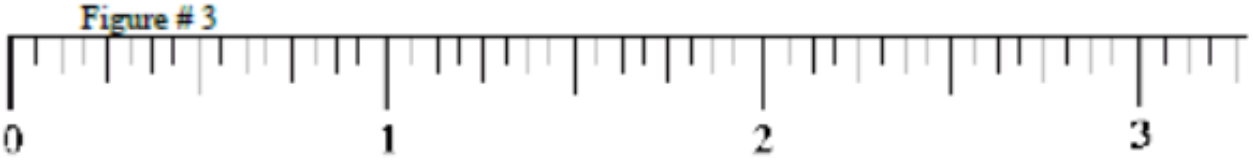

Figure # 3

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Carpentry Application Sample Math Questions
Answer Key

Addition:

1.) 431
212
100
+ 88
831

2.) 222
363
29
+ 976
1,590

Subtraction:

3.) 32,456
- 6,742
25,714

4.) 821
- 129
692

Multiplication:

5.) 564
×2.35
1,325.4

6.) 45.23
x .64
28.9472

7.) .444
× .04
0.01776

8.) 1.055
x .632
0.66676

Conversion: Conversions are used for measuring. Convert the following:

9.) 84 inches = 7 feet

10.) 72" = 6'

Division: Decimal functions are used in roof framing. Solve the following:

11.) 2,024.00 ÷ 3 = 674.66

12.) 3,951.00 ÷ 220 = 17.95

Conversion: The measurement of liquids for paints and stains are needed for interior finishes. Convert the following:

13.) 32 gallons = 128 quart(s)

Word Problems: Mathematical scenarios that a carpenter may need on construction sites. Solve the following:

14.) At $22.50 per hour, how much money will you earn in $39\frac{1}{2}$ hours? $888.75

15.) One meter is equal to 3.28 feet. How many feet in 20 meters? 65.6 feet

16.) If one kilometer is equal to 0.6 miles how many kilometers would you have traveled if you have traveled 42 miles? 70 kilometers

17.) A British Thermal Unit (BTU) is the amount of heat required to raise one pound of water one degree Fahrenheit. How many BTU's would be required to raise 22 pounds of water 16 degrees?
352 BTUs

18.) A column of water 2.31 feet high exerts a pressure of one pound per square inch. How much pressure does a column of water 24.20 feet high exert?

10.47 lbs per square inch

19.) In Figure #1, what is the circumference of the circle?

$C = 2 \times \pi \times r$ *where* $\pi = 3.14$

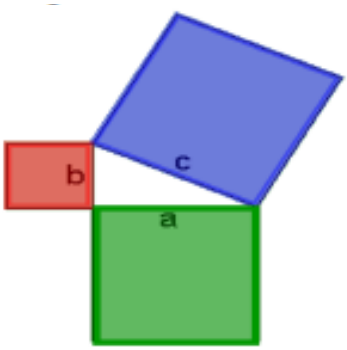
Figure #1 *r = 20"*

125.6"

20.) What is the area of Figure #1? $A = \pi \times r^2$ *where* $\pi = 3.14$ 1,256

21.) Using the formula $c = \sqrt{a^2 + b^2}$, what is the length of the side c in Figure #2 if a = 12" and b = 6" and c = ?

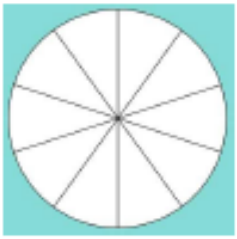
Figure #2



c = 13.41

22.) Geometrical shapes are an intergral part of carpentry layouts. The circle in Figure #3 is divided into 10 equal parts. What is the sum of degrees of all 10 equal parts?

Figure #3



360 degrees

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23.) Algebra is used to find the values of structual loads. Find the value of "*x*" in the following equations:

A. $4x + 10 = 3x + 30$ B. $x - 20 = 30$

x = 20 *x* = 50

Fractions:

Note: Calculating fractions is used for identifying lumber dimensions. Simplify all fractions.

Addition:

24. $6\frac{1}{2}$
$+ 4\frac{1}{8}$
$10\frac{5}{8}$

25.) $10\frac{1}{4}$
$+5\frac{1}{3}$
$15\frac{7}{12}$

Subtraction:

26.) $8\frac{3}{8}$
$- 4\frac{3}{4}$
$3\frac{5}{8}$

27.) 17
$- 6\frac{1}{16}$
$10\frac{15}{16}$

Multiplication:

28.) $\frac{1}{4}$ x 38 = $9\frac{1}{2}$

29.) $5\frac{3}{4}$ x $\frac{1}{2}$ = $2\frac{7}{8}$

Division: (write answers in mixed number form)

30.) 22 ÷ $\frac{3}{8}$ = $58\frac{2}{3}$

31.) $\frac{5}{8} \div \frac{1}{4} = 2\frac{1}{2}$

Addition: Decimals are used in numerous carpentry charts. Solve the following:

32.) 3.2015
.528
+12.5215
16.251

33.) .95
23.95
+22.751
47.651

Subtraction:

34.) 72.645
-2.999
69.646

35.) 656.95
-331.62
325.33

Multiplication:

36.) 52.92
× 0.444
23.49648

37.) 78.324
x0.18
14.09832

38.) 0.226
x 200
45.2

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Division: Express to the nearest thousandth.

39.) $\begin{array}{r} 26.200 \\ 0.20 \overline{)\,5.240} \end{array}$

40.) $\begin{array}{r} 3.726 \\ 4.2 \overline{)\,15.6520} \end{array}$

Express as a percentage:

41.) 0.10 = 10%

42.) 0.25 = 25%

Express in decimal form:

43.) 25% = 0.25

44.) 125% = 1.25

Find the value:

45.) 35% of 250 = 87.50

46.) 0.75 of 300 = 225

47.) 40% of 100 = 40

48.) In Figure # 1 what is the measurement displayed? $2\frac{1}{4}$"

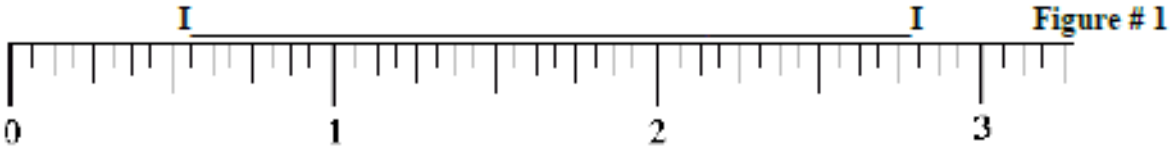

Figure # 1

49.) In Figure #2 what is the measurement displayed? 1"

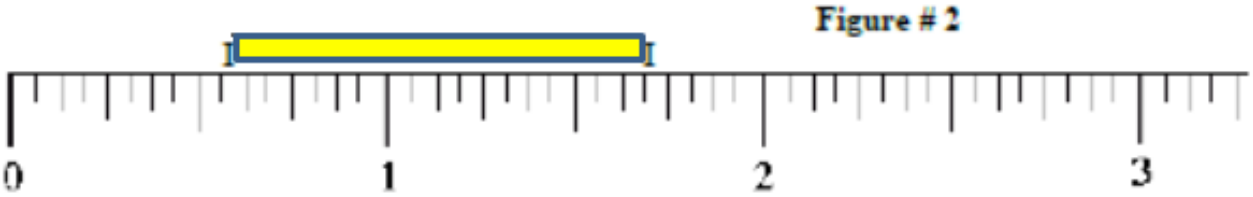

Figure # 2

50.) What is the unit of measurement on this ruler in Figure #3? Inch

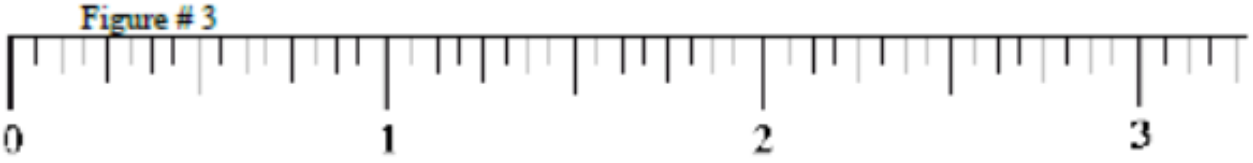

Figure # 3