The South Carolina Academy of Science

Web: http://scacademysci.org

PRESIDENT--Jeff Steinmetz
Francis Marion University
Coordinator of Environmental Science and Studies
PO Box 100547, Florence, SC 29502
Phone: (843) 661-1404, Email: jsteinmetz@fmarion.edu

PRESIDENT ELECT –TBA
xxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxx
xxxxxx

IMMEDIATE PAST PRESIDENT – Kevin McWilliams
Coastal Carolina University
Department of Chemistry and Physics
109 Chanticleer Drive, East, Conway, SC 29526-6054
Phone: Email: kmcwillia@coastal.edu

PAST PRESIDENT – John Kaup
Furman University
Coordinator of Science Ed, OIRS
3300 Poinsett Highway, Greenville, SC, 29613
Phone: (864) 294-3773, Email: john.kaup@furman.edu

VICE PRESIDENT – TBA
Xxxxxxxxxxxxxxxxxxxx
Xxxxxxxxxxxxxxxxxx
Xxxxxxxxxxxxxx
xxxxxxxxx

SECRETARY – Sheryl Wiskur
University of South Carolina
Dept of Chemistry & Biochemistry, GRSC 431
Columbia SC 29208
Phone 9803) 777 8143; Email: wiskur@mailbox.sc.edu

TREASURER – Edna Steele
Converse College
Department of Biology, Chemistry, and Physics
580 East Main Street, Spartanburg, SC 29302
Phone: (864) 596-9120, Email: edna.steele@converse.edu

Junior Academy Executive Director - John Kaup
Furman University
Phone: (864) 294-3773, Email: john.kaup@furman.edu

NEWSLETTER EDITOR – Bob Wolff
South University, Columbia
9 Science Ct., Columbia SC 29203
Phone: (803) 935-4345, Email: rwolff@southuniversity.edu

AAAS/NAAS REPRESENTATIVE AND MESAS DIRECTOR - Don Jordan
USC Columbia/ Director-MESAS
CAS / Science Education Center / c/o Biology Dept
Coker Life Science, CLS 108, Columbia, SC 29208
Phone: (803) 777-7007, Email: djordan@sc.edu

BULLETIN/PROGRAM EDITOR - David Ferris
USC Upstate
Div. of Natural Science & Engineering
800 University Way, Spartanburg SC 29202
Phone: (864) 503-5685, Email: dkferris@uscupstate.edu

ELECTRONIC JOURNAL – Michele Harmon
USC Aiken \ Department of Biology and Geology• SBDG 221A
471 University Parkway, Aiken, SC 29801
Phone: (803) 641-3607, Email: micheleh@usca.edu

SCAS Archivist – Graham Duncan
Curator of Manuscripts, "South Caroliniana Library", **UofSC**
Phone: (803) 777 2826, Email: DUNCANG@mailbox.sc.edu

E Contest / M Contest

2021 South Carolina Academy of Science MAIL-IN CONTEST
Sponsored by the South Carolina Academy of Science

Get Additional Copies of the 2021 "MESAS" Contest at
https://sc.edu/study/colleges_schools/artsandsciences/centers_and_institutes/science_education/

Ref: 2021 South Carolina Academy of Science MESAS Mail-in Contest Grades 4 - 8

To: All of South Carolina: Please Share

Principals, Teachers; District Leaders; Parents and Students.
All Regions: Western Region I; Midlands Region II; Upstate Region III, Sandhills Region. IV; Low Country Region. V; Aiken Savannah River Region and, Sea Island Region VII **(To all of South Carolina)**

Please find enclosed information about the mail-in contest for the Middle/Elementary School Academy of Science (MESAS) sponsored by The Center for Science Education (CSE) at USC & South Carolina Academy of Science (SCAS), produced by faculty and staff at Universities & Colleges in South Carolina and members of SCAS.

I have attached two MESAS Contests for your students (one for grades 4-6 "E Contest" and one for grades 6-8 "M Contest"). Please make as many copies as you need and distribute to your students. I hope your students have fun and learn something by competing in the contest. *Each student who participates will be recognized and each school that participates will have at* ***least one winner***. Winners will be announced in the SCJAS and SCAS newsletters and the SCAS Bulletin. The deadline for entry is **Monday, March 1, 2021.** The authors of the 2021 contest include Dr. Don Jordan and members of SCAS. We also have significant support from the Center for Science Education College of Arts & Sciences at UofSC.

We encourage students to use reference resources of all types, including the internet. However, we strongly discourage parent's assistance in finding the answers. This is a competitive contest meant to teach the children new methods of learning and exploring. We love the parent's involvement, but require the students find the answers on their own for this contest. Questions are prepared with respect to the standards for SC.

The South Carolina Academy of Science Annual Meeting will be held in the Spring at USC Aiken, Aiken SC. We hope to announce the winners of the SC Academy of Science MESAS Mail-in Contest by April 15, 2021

There will be lots of winners, not just one or two. ***We recognized at least one winner at each school and sometimes at each grade level***. Certificates and prizes will be mailed out to each student's principal so that the awards can be presented at the school's Awards Assembly. We have four levels of winners: **School, Region, State**, and **Grand Winners.**

Results will be returned to Teachers/Parents/Principals. (See contest rules next page for more details)

We also encourage MESAS students to participate in their regional science fair in March/April of 2021. Check with your regional science fair director whose address can be found on the web at Center for Science Education site

Click Here to visit CSE Home, College of Arts and Sciences, University of South Carolina
Then click **Middle Elementary School Academy of Science'**

If you have questions, please call me at 803-777-7007 or better email djordan@sc.edu
Sincerely,

Don Jordan, USC
State Executive Director & Founder, MESAS

South Carolina Academy of Science

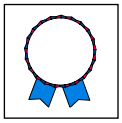
Rules for E (Grades 4 – 6) & M Contest (Grades 6 – 8)

Mail-In Contest

South Carolina Middle/Elementary School Academy of Science

2021 MAIL-IN CONTEST FOR SOUTH CAROLINA

Contest to be emailed to All Schools in South Carolina that contains a grade 4, 5, 6, 7, or 8 in Early January 2021



Contest Rules for E & M Contest :

1. Mail your contest to:
   Don Jordan, Executive Director SCAS/MESAS, Science Education Center, College of Arts & Sciences, Coker Life Science Building, CLS 108, 715 Sumter Street, c/o Biology Department, 4th Floor CLS, USC, Columbia SC, 29208; Phone (803) 777-7007.
   Email: djordan@sc.edu (There is a $5.00 entry fee for each contest)

2. **Entrants must complete all questions on entry form, sign, and mail entry and $5.00 fee to**: SCAS MESAS CONTEST c/o Dr. Don Jordan of Arts & Sciences, Coker Life Science Building, CLS 108, 715 Sumter Street, c/o Biology Department, 4th Floor CLS, USC, Columbia SC, 29208;. **If the entrant AND sponsor do not sign this form, they cannot receive any possible award.**

3. **Deadline**: Entry must be postmarked by **Monday, March 1, 2021**. (note contest is emailed in early January 2021

4. There will be lots of winners, not just one or two. Each school will have ***at least one*** winner and sometimes at each grade level..

5. A student can enter only **one** contest- either the MESAS **E**-Contest for grades 4-6 or the MESAS **M**-Contest for grades 6-8. (Students in the sixth grade have the option of choosing either the **E 4 - 6** or **M 6 - 8** contest.)

6. ***Everyone participating will be recognized***. Teachers/Parents will collect the entries and mail as a package to the above address. Results will be returned to Teachers/Parents/Principals.

7. Prizes will vary in value. ***All winners at each level will be recognized or awarded prizes.***

8. In 2020 the contest scores were very good overall, and a good percentage of the entrants qualified for an award. We had **221 winners** out of 311 participants (**approx 71% of the total number of participants were winners**). Certificates and prizes will be mailed out to each student's principal so that the awards could be presented at each school's Awards Assembly. We congratulate each and every contestant for his or her excellent effort!

9. Awards are given in four categories: Grand, State, Regional and School Winners. A unique feature of the contest is that **every** school that participates is guaranteed at **least one winner**. The Grand Prizes went to 15 students (8 M and 7 E) from **four** regions who submitted the top overall papers.

10. Winners will be announced on the **Arts & Sciences, Center for Science Education web-site.** In addition, results will be published in the **SCJAS Newsletter in May/June**. Schools will be asked to announce winners at one of their assemblies for students. Winners will receive honors certificates from the S.C. Academy of Science.

11. Each student is held to the ***code of ethics*** for entry into this contest. **The use of resource materials is encouraged**. **Each student must work on his/her own** except for the group or team Activities as described in the contest. Group activities can include parents, friends, or classmates.

_____ _____

Student Signature Sponsor (Teacher/Parent) Signature

{Teachers/Parents duplicate any parts of this test as needed. Check Center for Science Education CSE}

https://sc.edu/study/colleges_schools/artsandsciences/centers_and_institutes/science_education/

Click Middle Elementary School Academy of Science

Official M CONTEST Grades 6 - 8

Entry Form for SCAS MESAS Mail- In Contest

2021

(Whoever is mailing this form in should be considered the sponsor)

STUDENT'S HOME INFORMATION		SPONSOR'S INFORMATION
NAME		NAME:
ADDRESS		
CITY, STATE, ZIP		WK. PHONE:
AREA CODE/ PHONE #		
GRADE IN SCHOOL		EMAIL:
SPONSOR NAME		
STUDENT'S SIGNATURE **(REQ'D)**		

SCHOOL INFORMATION	
NAME of **SCHOOL**	
ADDRESS OF SCHOOL	
CITY, STATE ZIP	
AREA CODE/ PHONE #	
SCHOOL DISTRICT	
PRINCIPAL'S NAME	
SPONSOR'S SIGNATURE **(REQ'D) ***	

* If the parent is the sponsor then the parent signs

INSTRUCTIONS:

Failure to follow these instructions properly can lead to disqualification of the entrant's contest.

1. Print **CLEARLY** in the boxes above. Have your teacher, parent or legal guardian fill in the sponsor's information. Finally, ask your teacher/sponsor to fill in the school/teacher information.
2. Teachers/Parents duplicate any parts of this contest as needed: See https://sc.edu/study/colleges_schools/artsandsciences/centers_and_institutes/science_education/ This is the Center for Science Education Home Page, College of Arts and Sciences, UofSC
3. Place all answers to MESAS contest questions on the pages of the contest.
4. This contest is for ***students ONLY***. We encourage their use of any and all resources available, including the internet. Adults supplying the answers take away from the spirit and goals of this contest: to allow children to find new ways of learning, and encouraging the use of various methods of research, especially the scientific method.
5. Attach and return all entry & rule forms **with** your completed contest and entry fee of $5.00 per contest (see below) by **Monday, March 1, 2021.**
6. Mail to: **Dr. Don M. Jordan, USC / Center for Science Education / Coker Life Science Building, CLS 108 715 Sumter Street c/o Biol Dept. 4th Floor CLS / USC Columbia, SC 29208.**

South Carolina Academy of Science 2021 M-Contest Grades 6-8	Student Name: _____ Sponsor: _____ Sponsor Email: _____ School: _____ Score: Total of _____ points out of xxx points

All About the Microbial World

(CIRCLE THE CORRECT ANSWER OR PLACE YOUR ANSWER IN THE SPACE PROVIDED: USE INK WHEN POSSIBLE. (*EACH QUESTION IS WORTH 10 POINTS*)

1. Microbes isolated from the human body often grow more rapidly at that body temperature. At which temperature would they grow fastest?
A. 0^oC B. 5^oC C. 37^oC D. 60^oC E. 100^oC

2. The Respiratory Tract is the most common route of infection in humans. Which disease infects by this route?
A. Rabies B. Influenza (Flu) C. HIV (AIDS) D. Food Poisoning E. Tetanus

3. Which cell type is crucial to protecting against disease?
A. Red Blood Cell B. Nerve Cell C. Muscle Cell D. White Blood Cell E. Sperm Cell

4. Asthma can lead to difficulty in breathing due to inflammation in the lungs. Which of the following would be most likely to trigger an asthma type allergic reaction?
A. cold virus B. tobacco C. alcohol D. Ragweed pollen E. bacteria

5. Ringworm is not a worm, but is caused by a:
A. Plant B. Animal C. Fungus D. Bacteria E. Virus

6. A unicellular fungus is called a:
A. Mold B. Mushroom C. yeast D. puffball E. plant

7. Which of these is acellular?
A. Red blood cell B. Bacteria C. Fungi D. Virus E. Protozoan

8. Replication of DNA in bacteria takes place in the cytoplasm. Replication of DNA in humans does not take place in the cytoplasm due to a:
A. Mitochondrial Membrane
B. Chloroplast Membrane
C. Plasma Membrane
D. Lysosomal Membrane
E. Nuclear Membrane

All About Plants and Animals (CIRCLE THE CORRECT ANSWER OR PLACE YOUR ANSWER IN THE SPACE PROVIDED. USE INK WHEN YOU CAN. *EACH QUESTION IS WORTH 5 POINTS*)

1. A land plant produces flagellated sperm, water is necessary for reproduction, and the dominant generation is diploid. The plant is probably a(n):
A. bryophyte B. moss C. fern D. green alga E. angiosperm

2. Which one of the following plants does not have xylem?
A. fern B. tree (dicot) C. Marchantia (Liverwort) D. Equisetum (Horsetail) E. Lily (flowering plant)

3. The oldest flower is about _____ years old.
A. 50 million B. 100 million C. 65 million D. 142 million

4. The major difference between plant and animal cells is the presence of a:
A. nucleus B. cell wall C. mitochondria D. cell membrane

5. Organisms that require oxygen to carry out metabolic activities are considered:
A. aerobic B. anaerobic C. asexual D. photosynthetic

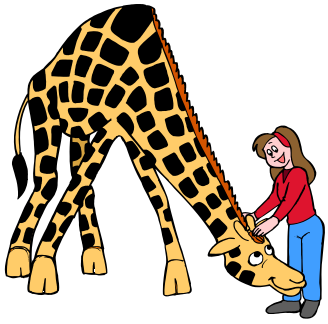
6. You are studying a plant that is heterozygous (Rr) for the color of its petals and all the plants appear red. If you cross this with another red heterozygote (Rr), you would expect how many of the plants to have white flowers?
A. 25% B. 50% C. 75% D. 100%

7. Loss of liquid water by plants is called:
A. translocation B. transformation C. respiration D. *transpiration* *E. none of these*

8. What is a butterfly before it goes through metamorphosis? A. Caterpillar B. larva C. egg

9. What are pintos, palominos and piebalds? A. Horses or B. Horse colors.

10. Oxygen readily passes from the air in your lungs into the red blood cells in your capillaries by the process of:
A. digestion B. diffusion C. osmosis D. infusion



11. Gas exchange takes place in your lungs in _____.
A. bronchi B. lymph nodes *C. alveoli* D. cell walls

12. What vessels carries oxygen rich blood to your body from your heart?
A. alveoli B. capillaries C. arteries D. veins

13. Digestion is completed, and most nutrients are absorbed in the _____.
A. mouth B. stomach C. small intestine D. colon

14. How does coprolite help us determine if a dinosaur was a carnivore or herbivore? ***(write answer on the line provided)*** _____

_____

15. Giraffes sure look funny with their long necks, but that particular adaptation has assured their survival as one of the many grazers in the African veldt. EXPLAIN WHY? ***(write answer on the line below)***

_____

(CIRCLE THE CORRECT ANSWER & PLACE YOUR ANSWER IN THE SPACE PROVIDE:
*EACH QUESTION IS WORTH 10 POINTS***)**

Apollo 8 Mission

1. Which of the following Astronauts never walked on the Moon?

(a) Neil Armstrong (b) Charles Duke
(c) Frank Borman (d) Alan B. Shepard (e) Charles "Pete" Conrad **1**. Ans: _____

2. Apollo 8 was launch on what month, day, and year.

(a) December 21, 1968 (b) December 24, 1968

(c) December 25, 1968 (d) December 26, 1968 (e) December 27, 1968 **2**. Ans: _____

3. Splash Down

The Apollo 8 astronauts returned to Earth on what month, day, and year.

(a) December 21, 1968 (b) December 24, 1968

(c) December 25, 1968 (d) December 26, 1968 (e) December 27, 1968 **3**. Ans: _____

4. How many times did Apollo 8 circle the moon?

(a) 2 (b) 4 (c) 6 (d) 8 (d) 10 4. Ans: _____

5. On Christmas Eve, December 24, 1968 on what was at the time the most watched TV broadcast, crew members (The first humans to travel to the Moon) Frank Borman, Jim Lovell and Bill Anders read a passage from ***what book in the bible*** as they orbited the Moon.
"For all the people back on Earth, the crew of Apollo 8 has a message that we would like to send to you."

(a) John (b) Revelation (c) Genesis (d) Psalms (e) Proverbs **5.** Ans: _____

6. The Crew members were named "Men of the Year" in what publication.

(a) Time Magazine (b) New York Times (c) The Harvard Review
(d) Business (e) Science & Technology **6.** Ans: _____

7. 1968 was an especially turbulent year in the United States.
How many of the following Statements are true?

(1) The Vietnam War was raging **(2)** Both Robert Kennedy and Martin Luther King Jr. were assassinated **(3)** Protests roiled the Democratic National Convention **(4)** At the end of 1968, when Apollo 8 splashed down, you saw ***hippies hugging old men*** in the streets. Something that was unthinkable just six days before that." **(5)** Frank Borman, mission commander, says there are a lot of parallels between 1968 and 2018, specifically how divided the country is — the anger, frustration, and mistrust. He wishes there were something on the horizon today like Apollo 8 to ***bring people together.*** During the six-day mission those things seemed to fade away as people were captivated by what they saw and heard.

(a) 0 (b) 1 (c) 3 (d) 4 (e) all five are true **7.** Ans: _____

8. There was also an unexpected moment during the 20 hours as Apollo 8 circled the moon. As they focused on the lunar surface below, something else caught the crew's attention. "Oh my God, look at that picture over there! exclaimed Anders. What was the picture?

(a) Picture of the Moon Surface (b) Picture of the backside of the moon

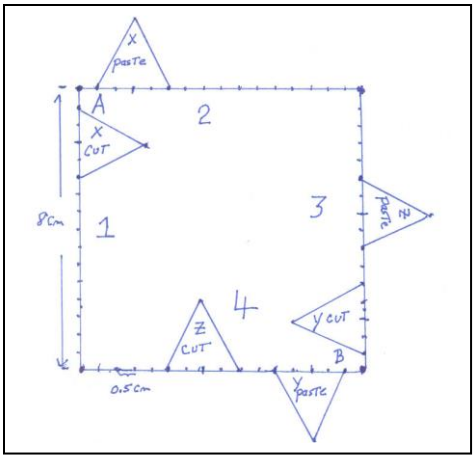
(c) The Earth Rise (d) The Sun (e) Mars **8.** Ans: _____

Tessellations Activity (30 points)

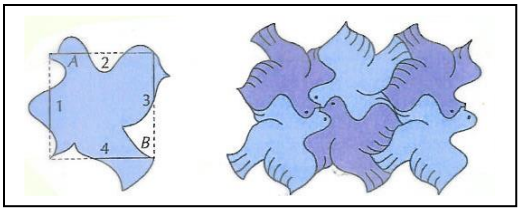
Follow the steps below to change a square into a shape that tessellates the plane.

(a) Cut out a square piece of paper 8 cm on a side. Label the sides as shown in the figure below.

Example with just 3 cuts and paste:



Alternate Example



(b) Draw and cut any shape out of side 1. Do not cut off the corner. Try to stay 0.5 cm from a corner.

(c) After you make your cut from side 1 then paste the cut-out to side 2. The piece must be as far from corner A on side 2 as it was from corner A on side 1. That is if you start your cut 0.5 cm from corner A on side 1 then the piece must be taped 0.5 cm from corner A on side 2. {important}

(d) Now do a cut on side 3 and paste to side 4. Be sure to tape the piece the same distance form corner B.{Very Important}

(e) You can continue this process with more cuts and paste if you like. The minimum cuts and paste are 2 to receive credit. I cut out five (5) congruent isosceles Triangles with base 2 cm and height 2 cm.- We did five cuts and paste. After you complete the cuts and paster add artistic details and draw the tessellation. We think our tessellation unit looks like an all-Terrain Armored **AT-AT Walker**, and combat vehicle used by the imperial ground forces in the original Star Wars.

(f) Write your **name**, **grade level** and **school** in the middle of your tessellation unit. Take a picture of your basic tessellation unit that will be used to tessellation the plane. Keep the picture and attach the actual Tessellation unit to this page. Have fun!

Take it in Stride: (Each question counts 10 points)

Use the template with this contest to make a 100-centimeter (cm) tape. Answer the following questions.
Circle the correct answer or place your answer in the space provided.

1. My 100-cemtimeter tape is equivalent to a 1 000 mm tape. 1. (a) YES True (b) No False

How to measure your stride

Although there are numerous ways to calculate your stride, the simplest way is to walk ten steps, measure the distance traveled, and divide that measurement by 10. Required tools include a metric measuring tape, chalk or other marking device, and a calculator. Please measure your stride using your 100-centimeter tape and answer the following questions.

2. I have completed my 100-centimeter tape and the tape and I walked 10 steps and the distance I traveled was about 10 meters. 2. (a) YES True (b) No False

3. I walked 10 steps and the distance I traveled was about 300 centimeters 3. (a) YES True (b) No False

4. My stride is in the more than 0.5 m but less than 0.8 m. 4. (a) YES True (b) No False

5. My stride is approximately _____ ____ m

6. Take your shoe off and measure the length of your foot.

The length of my foot is about _____ mm

7 Use the 100 cm tape to measure your height in centimeters. My name is _____

"How tall are you in cm?". Answer: _____ cm. I am in Grade _____

Page 5

Measuring Tape

(cm, mm)

When Assembling tape measure:

Cut along dotted lines

Line up and tape together (overlap if necessary)

After Printing:

Measure this tape with a metric ruler to see if 1 cm= 1 cm {tape off 3 mm for every 25 cm}