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Sandra Gray, Clemson University, 2015
Michelle Harmon, USC-Aiken, 2015
Tom Abrahamson, Midlands Technical College, 2016
Rodman Ali, Morris College, 2016
Mike Farmer, USC Upstate, 2016
Charles Keith, USC-Braxford, 2016
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Bill Pirkle, Undergraduate Research Committee and Governor’s Awards Committee
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Tom Falvey, SCJAS Committee
Roger Schmidt, SCJAS Committee
Edna Steele, SCJAS Committee
Tom Roop, Teacher of the Year Committee
Michelle Harmon, Electronic Journal

January 20, 2015

2015 MESAS MAIL-IN CONTEST
Sponsored by the South Carolina Academy of Science

Get Additional Copies of the 2015 MESAS Contest at
http://artsandsciences.sc.edu/cse

To: All of South Carolina:

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

Please find enclosed information about the mail-in contest for the Middle/Elementary School Academy of Science (MESAS) sponsored by The South Carolina Academy of Science (SCAS) and produced by faculty and staff at the University of South Carolina & 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 SCIAS and SCAS newsletters and the SCAS Bulletin. The deadline for entry is Monday, March 9, 2015. The authors of the 2015 contest include Dr. Don Jordan, Amber Atkinson, and Frank Jordan, USC and many members of SCAS, with support from the Center for Science Education.

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 is Saturday, April 11, 2015 at Furman University in Greenville South Carolina. We hope to announce the winners of the SC Academy of Science MESAS Mail-in Contest by that date.

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/Principal. (See contest rules next page for more details)

We also encourage MESAS students to participate in their regional science fair in March of 2015. Check with your regional science fair director whose address can be found on the web at www.scacadscience.org for specific dates.

If you have questions please call me at 803-777-7007

Sincerely,

Don Jordan, USC
State Executive Director & Founder, MESAS
Contest Rules:

1. Entrance fee is $5.00. Checks should be made out to MESAS – CONTEST and mailed with your contest to Dr. Don Jordan, Executive Director SCAS/MESAS, Science Education Center, College of Arts & Sciences, Sumwalt Room 321, Columbia SC, 29208; Phone (803) 777-7007. Email: djordan@sc.edu

2. Entrants must complete all questions on entry form and sign and mail to: SCAS MESAS CONTEST c/o Dr. Don Jordan, Science Education Center, College of Arts & Sciences, Sumwalt Room 321, 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 9, 2015.

4. There will be lots of winners, not just one or two. Each school will have at least one winner.

5. A student member of SCAS/MESAS 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. **We recognized at least one winner at each school and sometimes at each grade level.** We had 387 winners out of 673 participants (approx 57.5% of the total number of participants were winners). Certificates and prizes were 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! Grand and State Winners and sometimes Regional Winners receive cash awards.

9. Winners will be announced on the SCAS web-site, Arts & Sciences, Center for Science Education web-site and Bulletin. In addition, results have been 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.

10. 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 (if any). Group activities can include parents, friends, or classmates.

________________________________________________________________________________________

Student Signature                     Sponsor (Teacher/Parent) Signature
## OFFICIAL E Contest Grades 4 - 6
Entry Form for SCAS MESAS Mail- In Contest
2015

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

<table>
<thead>
<tr>
<th><strong>STUDENT’S HOME INFORMATION</strong></th>
<th><strong>SPONSOR’S INFORMATION (see above)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME</td>
<td>NAME:</td>
</tr>
<tr>
<td>ADDRESS</td>
<td></td>
</tr>
<tr>
<td>CITY, STATE, ZIP</td>
<td>WK. PHONE:</td>
</tr>
<tr>
<td>AREA CODE/ PHONE #</td>
<td></td>
</tr>
<tr>
<td>GRADE IN SCHOOL</td>
<td>EMAIL:</td>
</tr>
<tr>
<td>SPONSOR NAME</td>
<td></td>
</tr>
<tr>
<td>STUDENT’S SIGNATURE (REQ’D)</td>
<td></td>
</tr>
</tbody>
</table>

### 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. However, they will still receive a certificate of recognition for entering.*

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. You can find a copy (or extras, if needed) of the South Carolina Academy of Science MESAS Mail-In Contest at [www.artsandsciences.sc.edu/cse/MESAS](http://www.artsandsciences.sc.edu/cse/MESAS) as well as dates and other important information.
3. Place all answers to MESAS test 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 (see below) by **Monday, March 9, 2015**.
6. Mail to: **Dr. Don M. Jordan, USC / Center for Science Education / Sumwalt Room 321 / Columbia, SC 29208.**

E Contest 2015 Entry Form
SOUTH CAROLINA GEOGRAPHY – MAP EXPLORATION
(Each question is worth 5 points. Write in the correct response in the blank provided using blue ink. Use of Google Earth Recommended)

1. What island used during WWII as a bombing test site can be found at 34° 3’30.13"N  81°18’35.85"W?

2. This location in South Carolina has the highest altitude and can be found at 35° 3’53.18"N  82°46’38.49"W

3. One of two USMC recruit training facilities can be found at this location. 32°19’44.11"N  80°41’41.19"W

4. This house was built in 1777 and was seized by British Troops in 1780. 34°14’6.22"N  80°36’5.75"W

5. This location is named after the Native Americans that inhabited the area. 33.7833° N  80.7833° W

COLOR THAT REGION!
(Each region is worth 5 points. Color in the region with its corresponding color using the key below. 30 points total.)

- COASTAL ZONE
- OUTER COASTAL PLAIN
- INNER COASTAL PLAIN
- SANDHILLS
- PIEDMONT
- BLUE RIDGE
SOUTH CAROLINA STRUCTURES

FOR EACH STRUCTURE: GIVE ITS MEASUREMENTS (LENGTH/WIDTH/HEIGHT) IN **METRIC**
(Each question/blank is worth 5 points. Please write the correct answer in the space provided in blue ink)

Arthur Ravenel Jr. Bridge

<table>
<thead>
<tr>
<th>HEIGHT</th>
<th>________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>LENGTH</td>
<td>________________</td>
</tr>
</tbody>
</table>

Prysmian Copper Wire Tower

<table>
<thead>
<tr>
<th>HEIGHT</th>
<th>________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOORS ABOVE GROUND</td>
<td>________________</td>
</tr>
</tbody>
</table>

BASE 10
(Each question/blank is worth 10 points. Please write the correct answer in the space provided in blue ink)

1. What is 7,614 in expanded form __________________

2. What number is this? __________________

3. Convert the binary number 0100100101 to its base-10 primary number = __________________
BIOLOGY/CHEMISTRY AND LIFE SCIENCES
(Each question/blank is worth 5 points. Please circle the correct answer or write the correct answer in the space provided in blue ink)

1. ___________ are composed of two or more substances that are combined together but can also be separated from one another.
   A. Solutions      B. Mixtures      C. Solvent      D. Solute

2. The substance in a solution that has the least amount of volume or mass is the _________________.
   A. Solutions      B. Mixtures      C. Solvent      D. Solute

3. The living components of an ecosystem are called _________________.
   A. Abiotic Factors      B. Biotic Factors      C. Terrestrial      D. Non-terrestrial

4. All members of one species that live in a particular area are called a _________________.
   A. Community      B. Population      C. Group      D. Lek

5. ________________ is an organism that lives a large portion of its life on or within a host organism, usually causing harm to the host without killing it immediately.
   A. Parasite      B. Symbiote      C. Predator      D. Prey

COMPLETE THE CROSSWORD!
(Each question/blank is worth 5 points. Please write the correct answer in the space provided in blue ink)

![Crossword Image]

**ACROSS:**
3. Packages proteins
5. A cell that fuses with another cell during fertilization
6. Consists of one or more chains of amino acids
8. Studied pea plants to establish rules of heredity

**DOWN:**
1. This type of bond is an electrostatic attractive interaction
2. Obtain energy via photosynthesis
4. Origin of Species
7. Structural unit of all known living organisms

E CONTEST 2015   Grades 4 – 6   Total Points = ________________ out of Possible 65 Points
ART AND MATH “Magnificent Seven”

Draw pictures or cut and paste pictures of seven items (you can use anything --- Ducks, Cartoons, Cowboys, Super Heroes, the Continents etc.) Each of the seven items will represent one of the seven basic units in the metric system. Identify each character with one of the seven basic units with a brief description. We have provided examples at www.artsandsciences.sc.edu/cse/mesas# & www.scacademysci.org (click on MESAS).

1. **Meter** (m) 2. **Second** (s) 3. **Ampere** (A) 4. **Candela** (cd)

5. **Celsius** (C) 6. **Kilogram** (kg) 7. **Mole** (mol).

Using Landscape orientation, fit to one 8.5 by 11 inch page. Use color. Please print your name and school in the bottom right corner of the page. Take a picture or make a copy of your art and attach it to the SCAS MESAS 2015 Mail-in Contest. It will be graded based on the following rubric:

| Creative presentation of each of the seven objects | 10 points |
| Association and description used with your seven objects | 15 points |
| Use of color | 05 points |
| Overall artistry | 15 points |
| Spacing | 05 points |

Total Points = ____________

***------------------------------------------------------------------------------------------------------------***

Mystery Science Stories: Jumping Through Hoops; Setting: Soccer Ball Practice

Ms. O’Cork is the girls P.E. Teacher. She likes to mix up the activities each day to teach her class different kinds of exercises. Today, she brought a bunch of hula hoops for the girls to warm-up with, which they enjoyed. Because the back field is used for all kinds of sports, the field has no distance markings on it. After warm-ups Ms. O’Cork gathered everyone on the edge of the field, where she dropped a large bag of soccer balls and short metric measuring tapes (3 m long). “The School record for punting a soccer ball is 40 meters,” she announced, “Anyone who can break the record in the next two minutes and can prove it, does not have to run laps at the end of practice.” “But it will take that long just to measure 40 meters with these little 3 meter tapes,” Kaylee said. “Okay, anyone who can figure out how to accurately measure the distance in that time does not have to run laps either,” the teacher said. McKenzie turned to Lucy, who was the goalie on their soccer team and a good punter, and said, “I know a way we can both get out of running laps.” “What do you have in mind?” asked Lucy. McKenzie picked up the 3 meter measuring tape and began measuring the circumference of one of the hula hoops. She found that the Circumference was 273.3 centimeters.

(Questions 1 – 4 count 10 points each: Please circle the correct answer or write the correct answer in the space provided in blue ink)

1. How many of the following statements are true?

   (I) McKenzie measured the circumference of the hula hoop with the 3 meter measuring tape.
   (II) McKenzie measured the diameter of the hula hoop, divide by 2 and used C = 2πr to find the circumference.
   (III) McKenzie measured any chord which was not a diameter and used the length of the chord and multiplied by six.
   (IV) McKenzie viewed the hula hoop as a circle and found the Area and divided by two to get the circumference.

   (a) Only (I) & (III)  (b) Only (II) & (III)  (c) Only (I) & (II)  (d) Only (I), (II) & (IV) Ans: ____________

2. Lucy suggested rolling the hula hoop 15 times from the starting point which would yield a total distance that is ____________

   (a) Less than 40 meters  (b) Greater than 40 meters  (c) Equal to 40 meters  (d) 0 meters

3. If Circumference C = 273.3 cm then the diameter is close to ________________

   (a) 87 cm  (b) 0.87 dm  (c) 8.7 cm  (d) 0.87 dm

4. Lucy warmed up and kicked the soccer ball beyond the marked distance! Do you think she kicked the soccer ball beyond the record 40 meters?

   (a) Yes  (b) No  Ans: _______________

Reference:
65 Short Mysteries You Can Solve With Science by Eric Yoder and Natalie Yoder Science Naturally .com (5th edition January 2014) Recommended by the National Science Teachers Association (NSTA)