MESA Escape Room
Math Challenge

LEVEL: Grades 6 – 8

TYPE OF CONTEST: Team

COMPOSITION OF TEAM: 2-3 Students per team

NUMBER OF TEAMS: Preliminary – Determined by your MESA Center
Regional – determined by the Host Center

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OVERVIEW: Students will work in teams of two to three to solve challenging performance and/or problem-based real-world problems using general mathematics skills and techniques. Through collaboration, teams will solve a series of non-routine problems requiring creative deductive and reasoning skills to "unlock" the door to the MESA Escape Room. **Participation logistics, limits, and competition facilities may vary by host site. Advisors and students are responsible for verifying this information with their center director**

MATERIALS: The Host Center will provide the following:
- Answer Sheet distributed in a 9" X 12" Clasp Envelope
- 5 Problem Sets per team (Each problem set distributed individually)
- Pencils

Each team will provide the following:
- Calculators (acceptable calculators described in General Rule #14)

GENERAL RULES:
1) Teams must consist of 2-3 students. Teams consisting of 1 student will not be allowed to compete.
2) There is no restriction on the composition of a team. Teams may consist of students from any grade or math level.
3) Each team members name, school name, and MESA Center must be completely filled out on the answer sheet. If any of the above items are incomplete, the team will be disqualified.
4) Teams will be allowed 2 hours to solve a total of 5 problem sets and "escape" the escape room.
5) Each of the 5 problem sets may be one question or a series of connected and dependent questions.
6) Each team will receive one problem set at a time. Once a team has correctly answered the first problem set, they will receive the next problem set. A correct answer is required to advance to the next problem set.

7) Once complete, teams will place each problem set into their envelope and write their answer on the answer sheet. Only answers legibly written on the answer sheet will be judged.
8) Once the team has solved the 5th and final problem set they will advance to "unlock" the escape room.
9) Only teams that have answered the 5th set will be eligible to escape. All other teams must continue to work through the problem sets.
10) The following math concepts map be covered: General Math, Pre-Algebra, and some Algebra 1.
11) The problem sets will vary from applied logic riddles, graphing, or questions from math related fields.
12) Scratch paper is not allowed. As each problem set it printed on a separate sheet of paper, teams may use both sides of this sheet to solve the problem. **Any work done on this sheet will not be used for scoring purposes** Only answers on the answer sheet will be considered.
13) Books, mathematical tables, or other resource materials may not be used.
14) Scientific calculators may be used. Graphing calculators are not allowed. Only non-QWERTY calculators are permissible and must be supplied by the team. Calculators that have typewriter-like keyboards, require an electrical outlet, make noises, or use paper are not permitted. Additionally, devices with embedded calculator functions such as cell phones, iPod/iPad, laptops or tablet computers are strictly prohibited.

JUDGING:
1. Lead contest judge will assemble all participants and review the event guidelines and judging criteria, verify only permissible calculators are present, and distribute pencils and answer sheets.
2. Per General Rule # 3, each team will legibly write each team members name, school name, and MESA Center on the answer sheet. If any of the above items are incomplete, the team will be disqualified.
3. Each team will receive Problem Set #1 in a sealed envelope Teams must not open the envelope until instructed to do so.
4. Five (5) proctors will be placed around the contest room, each designated with the number of the next corresponding problem set. (Proctor #2, #3, #4, #5, Escape/Unlock)
5. Once the lead judge has signaled the beginning of the contest, teams may open and begin solving the first problem set.
6. Once the team has solved the first problem set, one member of the team will take the answer sheet to the proctor distributing the second problem set. The proctor will check the teams answer sheet and upon verifying the correct answer, will give the team problem set #2. If the teams answer is incorrect, the proctor will indicate so and the team may continue to work on the problem set until they reach the correct answer.
7. This will continue until the team reaches and solves problem set #5. The answer to problem set #5 will contain the code to "escape" the room. Teams will submit their final answer to the proctor, who will verify if it's correct or not. If it's correct, the submission time will be recorded, and the team has successfully escaped the room. If it's incorrect, the team must return to their station to attempt another solution.
8. For tie breaking purposes, proctors will record the time a team takes to complete problem sets #1-4 correctly.

SCORING:
1. Winning teams will be determined by the following:
   a. "Escaped" the room with the correct code in the fastest time.
   b. If no teams "escape", winners will be determined by the fastest times to complete Sets #1-4.

AWARDS:
● Medals will be awarded for 1st, 2nd, and 3rd place, regardless of grade level.

ATTACHMENTS:
• Sample Problems

Sample Problems

These problems are for informational purposes only. These may be standalone problems or may be one component of a multi-part problem set. (**Answers shown in bold.**)

Sample #1:

Danny sells apples, he sold half his apple stock plus one more to his first customer of the day. To the second customer, he sold half of the remainder plus one more. To the third customer, he sold half the remainder plus one more; and to the fourth customer, he sold half the remainder plus one more. Danny was now out of apples. How many apples did Danny have for sale at the start of this day? **30**

Sample #2:

There is a grandfather clock that chimes the appropriate number of times to indicate the hour (1 chime for 1 o'clock, 2 chimes for 2 o'clock, ect..) as well as chiming once at each quarter hour. If you were in the other room and heard the clock chime just once, what would be the LONGEST period of time you would have to wait in order to be _certain_ of the correct time? (the clock is working properly and is set at the correct time.)
90 min (12:15 to 1:45)

Sample #3:

There is a cage at the city Zoo that contains Both Flamingos and Wild pigs. If there is a total of 30 eyes and 44 feet, how many of each are in the cage?
7 pigs, 8 birds (2x + 4y = 44, 2x + 2y = 30)