

## “Treasure Mountain”

## A Science Olympiad Road Scholar Exam

Shortly past 5:00 p.m., Tina returned to her small, cozy apartment located in Durham [R-15] directly across the street from the University of New Hampshire. Tina was about to complete her doctorate in archeology and was anxious to put her skills and knowledge to work.

Tina fetched a cold soda from her refrigerator and sat down to relax for a few moments before joining her best friend, Amy, for dinner. She and Amy had become inseparable friends from the moment they had met a short two years ago. Amy was working toward her Masters Degree in geography.

The phone rang, startling Tina. She hadn't realized just how exhausting those long hours of research in the library had been. Her Aunt Irma was on the line. Tina was stunned when her aunt informed her that her Great Uncle Rufus, who had lived his entire life in Portsmouth [S-16, NH Highway Map], had just passed away.

The funeral had been scheduled for the following day. Fortunately there would be no conflict with time as tomorrow was Saturday. She could still enjoy dinner with Amy that evening and leave for Durham in the morning.

Tina left Durham and proceeded to Portsmouth via US-4. This route is also known as the [1 HM Portsmouth Inset] Turnpike in Portsmouth. She knew she was near the funeral home when she passed the [2 HM Portsmouth Inset] International Tradeport.

The funeral wasn't quite the ordeal Tina had dreaded. Her Uncle Rufus was ninety years of age and had been in failing health for the past several years. After the internment, Tina returned to Durham. Dissertation research and classes kept her occupied. Several times she found herself reminiscing about her Uncle Rufus and how he had attempted to share his love of topographic maps with her during her many childhood visits. Being so very young, Tina had preferred the backyard swing and nearby woods to anything academic.

On the very last day of classes, nearly two months after her Great Uncle's funeral, Tina received notification of a registered letter in her post office box. Upon signing the forms and being handed the letter, she noted the address ... Haskins and Haskins, Attorneys at Law. Hastily and excitedly opening the envelope, she unfolded the letter inside. Her presence was being requested for the reading of her Uncle Rufus' last will and testament. Tina could hardly wait to share this news with her friend Amy.

“I don't believe my Uncle Rufus had much money,” Tina said to her friend. “He seemed to have lived a fairly simple life. I didn't realize I meant that much to him. Now I wish I had spent more time with him, even if it had meant my having to spend much of it in his map room.”

“Are you going to the reading?” asked Amy.

“Definitely. I really believe I should be there. It’s scheduled for Tuesday morning at 9:00 a.m.”

“Why don’t you travel to Portsmouth with me. I know some great places there. We could spend the afternoon shopping. We’ve both been working really hard. I think we deserve a break. Don’t you?”

“Great idea!” Let’s ask Reggie and Payton to join us. We’ll make a day of it.”

Reggie’s real name was Reginald Aster IV. His family owned nearly half of Durham. Reggie and Amy had been engaged for nearly two months. Payton, Tina’s fiancé, was the university’s head tennis coach.

Early Tuesday morning, the four friends climbed into Reggie’s cherry red Mustang and headed for the law offices of Haskins and Haskins. Their office was located in downtown Portsmouth at the intersection of New Castle Avenue and Wentworth Road. [HM Portsmouth Inset]

Tina hurried inside while her friends strolled down to the riverfront to idle away the time. Peering across the river, they could observe the seemingly endless activity at the Portsmouth Naval Shipyard.

“I’m curious to know why this river came to be called the [3 HM Portsmouth Inset] River?” Amy asked.

“I suppose it’s a Native American term,” Reggie suggested.

“Well, anyway, it’s quite an important river. It shares its boundary with both the states of New Hampshire and [4 HM].”

Nearly an hour later, Amy spotted Tina leaving the law office. Excitement beamed in her face as she approached them. Tina shouted, “Great Uncle Rufus willed me his vacation cabin in Manchester. I’m sorry I took so long. I had to sign a few extra papers because Manchester is located in [5 HM] county, requiring a few additional signatures.

“Look! Old man Haskins gave me the deed and the keys. Let’s skip our shopping expedition and find my new cabin. Okay?”

“Sure. Why not?” replied Reggie. “It’s less than 100 miles from Portsmouth to Manchester. From the intersection of US-4 and I-95 we can take I-95 south to NH-33. NH-33 ends at HN-108. We can take NH-108 to NH-101. We will then pick up NH-101

on the north side of Exeter. Traveling west on NH-101 will take us right into Manchester.”

“Terrific, Reggie!” You sure know your roads!” exclaimed Tina.

“I haven’t been to Exeter in years,” Payton said. “I wonder whether it’s gotten much larger.”

“Well, according to the NH highway map, its population is now [6 HM],” answered Reggie.

They arrived at the cabin at half past eleven. They found it in need of a paint job and a thorough cleaning. Other than that, however, it appeared to be structurally sound.

During their tour of the small cabin, Amy spied an old geography book she had admired for years. As she removed the book from the shelf, she spotted a small black handle through the now open space between the neighboring books.

“Look what I’ve found!” Amy shouted excitedly.

“Pull it,” Tina ordered in a calm, but commanding voice.

As Amy pulled the handle, the entire set of shelves was set in motion, exposing a hidden entrance leading to a darkened room behind.

Entering slowly and cautiously, Payton saw a small table in the shadows. As he approached the table, a wrinkled piece of paper with a key attached came into view.

“This is definitely not a house or car key,” Payton stated bewilderedly.

“Taking the key from Payton to examine it more closely, Reggie said, “This key has a number engraved on it. It may be a key to a locker or security box. Tina, read the note.”

“It reads ‘Your destination is east of the Merrimack and south of the Ball.’ I wonder what that means.”

“Whatever it means, I’m certain we’ll need a map.”

Quickly surveying the room, Tina mumbled, “There’s not a single map in this entire room.”

“Hey, guys. Wait,” interrupted Amy. Remember those topographic maps we saw in the living room?”

Rushing into the living room, they quickly located the topos. Within moments the maps were spread out on the huge dining room table.

“The clue is sure to be found on one of these topos,” remarked Tina. “I knew my uncle loved maps, but I didn’t know he was so creative. Everyone, grab a couple quads. With a little luck, we may decode the message.”

Within minutes Reggie exclaimed, “I got it! Look! It’s on the Concord Quad. Right here’s the Merrimack River and in sector 3 there’s something called the Sugar Ball. To the south is the Concord Municipal Airport. Don’t you see? Airports have lockers! That has to be it!”

Tina asked, “What’s the PLSS for the Sugar Bowl?”

“I can’t give you a PLSS for the Sugar Bowl because New Hampshire [7 C].” replied Reggie.

“Let’s go!” shouted Tina. “Bring all the maps. We’ll probably be needing them.”

Returning to the Mustang, Reggie announced that he was taking I-93 from Manchester to Concord even though a small part of that route was a toll road.

If the toll were 3 cents per mile rounded to the nearest nickel, how much should they be prepared to pay as they pass through the tollbooth? [8 HM]

In Concord, they parted I-93 at exit 14 and merged onto NH-9. This road also bore the name [9 HM Concord Inset] Road on which they would continue on to the airport.

During the short trip from downtown Concord to the airport, Payton asked Amy whether she would familiarize him with the features found on a topographic map.

“Sure,” replied Amy as she reached for the Concord Quad.

“Near the bottom center, is the map ‘scale’. A scale of ‘1 to [10 C]’ means that each individual unit equals that number of total units. The ‘series’ is located here in the northeast corner. The series of this quad is [11 C] minutes. This name located in the bottom margin lets us know which quad is to the south. In this case, that would be the [12 C] quad. Surprisingly simple? Isn’t it?”

“Sorry, Payton, We’re at the terminal so we’ll have to forego the rest of the lesson for now,” sighed Amy.

Entering the terminal, Reggie spotted a sign pointing in the direction of the lockers. They soon found a locker whose number matched the one on the key.

As his friends looked on, Reggie inserted and turned the key. Inside he found a note, another key, a photo of a run-down house, and a claw hammer. Reggie then read the note, "Take 202 and then 202A. In BC you'll find what you are seeking ... with worms and water."

Back in the Mustang once again, they couldn't help but wonder what that strange message meant.

Amy said, "Those numbers ... they could be roads. Reggie, see whether you can find roads matching those numbers on the highway map. The rest of us will search the quads for those numbers as well."

In just a moment, both Tina and Payton shouted, "Here they are!" Tina had been scanning the Baxter Lake Quad while Payton had been scanning the Concord Quad.

"Any idea what the letters 'BC' stand for?" asked Reggie.

"Here's a place called Berry's Corner ... BC ... That must be it!" shouted Tina. It's on the Baxter Lake Quad. And, look, NH-202A passes right through it."

"Here's US-202 on the highway map," Reggie declared. Let's navigate with the Concord Quad for a moment. It has much greater detail."

Amy, consulting the Concord Quad, directed Reggie to return to I-93, the way they had come. Just before reaching I-93, they crossed the Merrimack River on the [13 C] Bridge. They merged north on I-93 and proceeded to interchange 15. Here they left I-93 to head ENE on US-202, which is also US- [14 C] and I-393.

As the party crossed the Merrimack River heading toward the eastern neat line of the quad, Reggie remarked, "The compass indicates that we're traveling at an azimuth of [15 C] degrees. Does that sound right to you guys?"

"Yes, we're about to enter the [16 C] Quad," Amy replied.

Payton, following their progress on the highway map, observed, "If we keep going on this road, we'll be going right back to Durham."

Leaning over his shoulder while attempting to read the highway map, Amy responded, "You're right, Payton, only if we have our heads in the clouds. See where NH-

202A, US-202, and US-4 split near the small town of [17 HM], which incidentally, is in [18 HM] County?”

“We’re in a town named Epsom now,” Tina said. “How many miles before we turn?”

“It’s [19 HM] miles from Epsom to where US-202 veers off to the left.”

Shortly after US-202 left US-4 they came upon the split and turned onto NH-202A. They passed a lake to the left called [20 HM], the same name as that of the village situated near its easternmost shoreline.

“When will we have to start using the Baxter Lake Quad?” Payton asked.

“Well, the western neat line of the Baxter lake Quad is [21 BL] longitude. Center Strafford, in sector 7, is the first town we pass through on NH-202A.”

“What’s the distance from the western neat line to Berry’s Corner?” Reggie asked.

“I’ll have to use a string to get that measurement,” Amy replied. “Let’s see. It’s [22 BL] miles,” she replied after measuring and calculating the distance.

“What’s all this green on the Baxter Lake Quad?” Payton asked.

“Just full of questions, aren’t you? Even I know what the green represents,” Tina remarked. It’s because the vegetation is [23 BL].”

Upon arriving in Berry’s Corner, they quickly found the house after showing the photo to several of the locals while seeking help with directions. Once inside the house, they discovered that it seemed much larger than its outside appearance had suggested.

“This task is going to take forever,” mumbled Reggie. The clue tells us that the treasure is with the worms and water, so it’s got to be under one of these floorboards. But, which one? We have only one claw hammer, and there’s lots of flooring to pull up.”

“Not so fast!” cautioned Payton. “The ‘worms’ tell us it’s under the floor, but maybe ‘water’ means it’s where the well comes into the house. Let’s check the kitchen first.”

They soon located the pipe that brought the water to the kitchen and immediately set out to remove the flooring surrounding it. Sure enough, there was something there. It was an old, rusty metal box. Reggie lifted the box onto a countertop. Payton, with one sharp tap of the hammer, broke open the lock.

Within the box they found yet another note. This one was written on an index card. Payton began to read, “Near the Pesky and the Little Dead Diamond, there is a mount. Climb to the top and you’ll find what you’ve been searching for. X plus 5N marks the spot.”

While Reggie and Payton replaced the flooring, the girls studied the Baxter Lake Quad.

“It appears as if [24 BL], in sectors 5 and 6, is the largest lake on the quad,” Tina remarked. “What is that dashed line running across the lake?”

“That’s a [25 BL],” Amy replied.

“See the symbol that looks like a wigwam or teepee on the eastern side of the lake. That must be a symbol for a [26 BL]. There are a number of [27 BL] (A. primary; B. Secondary; C. Unimproved) roads leading from the wigwam to the lake.”

“What’s this black cross just north of Baxter Lake?” asked Tina.

“That’s a graticule tic mark. There are [28 BL – state the number] of these on every 7.5 minute topographic map. Tic marks may be used to divide a topographic map into nine sectors. The coordinates of this tic mark are [29 BL] latitude and [30 BL] longitude,” Amy explained.

“What’s the value of the contour line that passes through the NE graticule tic mark?”

“Oh, that’s a(n) [31 BL] [Choices: A) index; B) intermediate; C) supplementary] contour. The contour interval of the Baxter Lake Quad is [32 BL], so its value is [33 BL].”

After the guys had finished replacing the floorboards, the group decided they’d had enough and decided to return to Durham. It was getting late, and they were starving. With some food and a good night’s rest they felt they’d be much better prepared to continue their quest in the early morning.

The next morning the four friends met for breakfast in the Student Center at 8:00 a.m. Afterwards they took the notes and maps to a deserted faculty lounge to make plans for the day.

During the short discussion that followed, Tina shared what she had discovered. “In sectors 1 and 2 on the Mount Pisgah Quad are the names of two places mentioned in

the note ... Pesky Brook and Little Dead Diamond River. To the northwest is Mount Pisgah. That must be the 'mount' mentioned in the note."

They left the Student Center and jumped into Reggie's Mustang. Amy located Mount Pisgah on the highway map [D-14], and said, "NH-16 north will take us near the place we're headed for. We can turn onto NH-16 in Dover."

Reggie headed for Dover as suggested. When they arrived in Rochester, they spotted a sign directing them to turn north to the city of Berlin. "What's those small green dots next to route NH-16?" asked Tina.

"Those dots help tourists pick out the most [34 HM]," responded Amy.

Before reaching Berlin, they entered the [35 HM] National Forest and passed near the highest point in New Hampshire -- Mt. Washington with an elevation of [36 HM] feet. As they passed through Gorham, Amy asked, "How much farther is it to the border?"

Reggie replied, "We just passed a sign at the SR-2/NH-16 intersection indicating that it is [37 HM] miles to Maine. But, we're continuing on NH-16. If you add the little black mileage numbers along the route, the sum tells us that the border is [38 HM] miles away.

At the New Hampshire-Maine border near the Swift Diamond River, Amy said, "This is just about as close to Mount Pisgah as we're going to get by car."

Reggie replied, "As I was studying the Mount Pisgah Quad this morning, I realized immediately this was going to happen. I called my brother and asked him to pick up a motorized raft, plus all the equipment, food, and supplies we'd need for a pretty rugged river ride and a rather tough hike through the woods. A helicopter will be dropping these supplies within an hour."

"It must be nice to have money," Payton teased with a wide grin on his face.

"It sure doesn't hurt," a smiling Reggie replied.

The chopper arrived as promised. The team loaded everything onto the powerboat and put on their hiking boots. Soon they were gliding up the river.

"This road map isn't going to help us now," Amy said as she folded it and put it into her backpack. She then took out the Mount Pisgah Quad. Now that we've crossed the eastern neat line [sector 3], we can use this quad. We're on Little Dead Diamond River, and we have to make certain that we stay on it if we intend to reach Mount Pisgah in sector 1."



As they sailed westward on the river, Tina asked, “Is this a perennial or an intermittent stream?”

Amy responded, “The Little Dead Diamond River is a(n) [39 MP] stream.”

“This sure is a wilderness. Do you think there might be any kind of economic activity in this area?” Reggie inquired.

“Well,” Amy replied, “To the north are several symbols of crossed shovels. Crossed shovels is a symbol for [40 MP].”

The river curved to the northwest. A short distance farther, the South Branch split to the left. Amy noted that they were still on the Little Dead Diamond River. They soon passed two small buildings on the bank to the right. Amy noted a benchmark next to the buildings. This benchmark displayed a value of 1627 feet above sea level.

Tina asked, “What kind of a benchmark is marked with a small “x” like the one next to the two small buildings?”

“I believe that’s a [41 MP],” replied Amy.

“How do people get to those buildings?” Reggie asked.

“There’s a [42 MP] leading up to the them,” Amy answered.

They passed Pesky Brook [sector 2] curving off to their right. One half mile later, they came upon another fork in the river. Amy suggested they take the branch to the left as it would take them closer to the summit of Mount Pisgah.

The river became noticeably narrower, and the water was flowing much more rapidly than it had farther downstream. The boat, however, managed to successfully battle the current. Soon the river ended and the adventurers pulled their boat onto a rocky beach.

Amy, peering off in the direction of the summit, said, “The trees are so dense I can’t even see the summit of Mount Pisgah. The river ended at the [43 MP] foot intermediate contour. So, if we are at that elevation, we will have to climb another [44 MP] feet to reach the summit. The distance from the end of the Little Dead Diamond River to the summit is [45 MP] feet. Therefore the gradient is [46 MP] feet per 100 feet. Even our calculations show this is going to be a pretty tough climb.”

“We can do it!” proclaimed Tina. “We’re so close to the treasure that nothing can stop us now!”

“I’ve got the compass, Amy.” Reggie said. “Use it along with the map to shoot a bearing to the summit.”

“The bearing is [47 MP] degrees, but it’s going to be extremely difficult following that bearing if we have to skirt all those trees.”

“It will help knowing that we’re always going uphill,” Payton added.

They parted the boat and started the climb. It took nearly an hour to reach the summit. Once there, it took but a moment to locate the tablet marked with an “x”. A brief rest was followed by a quick review of the note that had brought them here.

“Okay,” Tina said. “Now we have to go 5N from the ‘x’.”

“Five what?” asked Payton. “It could be five feet, five paces, or five miles for all we know.”

“Let’s start with five feet. It’s the smallest unit,” Reggie suggested. “Payton, hand me the shovel, please.”

Reggie carefully measured five feet north of the tablet and started to dig. About a foot down, the shovel struck something solid. After quickly scooping away the dirt and rocks, he saw the wooden chest fastened together with metal bands. They attempted to lift the chest out of the ground, but found it much too heavy.

Reggie said, “Amy, find the coordinates, and I’ll call for the chopper. It can drop a hook and pull the chest up.”

“The NE corner of Sector 1 is very close to the “x”. The coordinates at that location are exactly [48 MP] north latitude and [49 MP] west longitude. That should bring the helicopter within visual range of the summit. Should it not?”

The helicopter arrived at 4:00 p.m. It dropped a steel cable with a hook at the end and easily hoisted the chest up and into the fuselage of the craft. By cell phone, Reggie requested the pilot and crew to deliver the chest to his estate in Durham.

“Let’s get moving,” Tina commanded. “I’m anxious to see what’s in the chest!”

They arrived at Reggie’s estate shortly after 7:00 p.m. It was still light when they opened the lid of the chest to reveal the “treasure” inside.

“Is it gold or silver or jewels?” asked Payton.

“Oh, no!” exclaimed Tina. “It’s full of old topographic maps. There must be hundreds of them. I may not be rich, but I am sure never to get lost.”

“You still have the house with the secret room. Maybe there are clues to other hidden treasures.”

“You’re right. Let’s go back to my house and search,” agreed Tina.

“No way!” shrieked Amy, Reggie, and Payton in unison.



**Participant Response Sheet**

The following maps and quads will be used during this exam:

- 1. **New Hampshire Highway Map**, Rand-McNally [HM]
- 2. **Concord**, New Hampshire Quadrangle Map [C]
- 3. **Baxter Lake**, New Hampshire Quadrangle Map [BL]
- 4. **Mount Pisgah**, New Hampshire Quadrangle Map [MP]

1. _____	26. _____
2. _____	27. _____
3. _____	28. _____
4. _____	29. _____
5. _____	30. _____
6. _____	31. _____
7. _____	32. _____
8. _____	33. _____
9. _____	34. _____
10. _____	35. _____
11. _____	36. _____
12. _____	37. _____
13. _____	38. _____
14. _____	39. _____
15. _____	40. _____
16. _____	41. _____
17. _____	42. _____
18. _____	43. _____
19. _____	44. _____
20. _____	45. _____
21. _____	46. _____
22. _____	47. _____
23. _____	48. _____
24. _____	49. _____
25. _____	

## Treasure Mountain

## Answer Key

- |                                |                      |
|--------------------------------|----------------------|
| 1. Spaulding                   | 26. Campground       |
| 2. Pease                       | 27. C [Unimproved]   |
| 3. Piscataqua                  | 28. 4                |
| 4. Maine                       | 29. 43° 20' N        |
| 5. Hillsborough                | 30. 71° 2' 30" W     |
| 6. 9556                        | 31. B {Intermediate} |
| 7. Doesn't use the PLSS System | 32. 20'              |
| 8. 35 cents                    | 33. 440'             |
| 9. Loudon                      | 34. Scenic routes    |
| 10. 24,000                     | 35. White Mountain   |
| 11. 7.5                        | 36. 6288'            |
| 12. Goffstown                  | 37. 10               |
| 13. Loudon                     | 38. 37               |
| 14. 4                          | 39. Perennial        |
| 15. 070° ± 003°                | 40. Gravel pit       |
| 16. Suncook                    | 41. Spot elevation   |
| 17. Northwood                  | 42. Trail            |
| 18. Strafford                  | 43. 2700             |
| 19. 11                         | 44. 381              |
| 20. Bow Lake                   | 45. 1500             |
| 21. 71° 07' 30" W              | 46. 25.4             |
| 22. 3 miles                    | 47. N 37° E ± 02°    |
| 23. Woods or brushland         | 48. 45° 00'          |
| 24. Baxter Lake                | 49. 45° 12' 30"      |
| 25. Corporate boundary         |                      |

For information on how to quickly obtain a set of USGS Quads plus the Highway Map for **Treasure Mountain** at very reasonable cost, plus other coaching aides, visit the following site:

<http://www.otherworlds-edu.com>

**Trail of the Vampires**, another free, downloadable Road Scholar exam located on this web site uses the same set of Quads plus highway map as the exam – **Treasure Mountain**.