

**1998 Massachusetts Science Olympiad  
B-Division Road Scholar Event  
Tufts University**

The following code identifies the quadrangles and highway map included in this exam:

<b>MH</b>	=	Mount Holyoke Quadrangle
<b>B</b>	=	Belchertown Quadrangle
<b>WD</b>	=	Winsor Dam Quadrangle
<b>MAHP</b>	=	Massachusetts Highway Map

Record your responses on the answer sheet.

**The Quabbin Quest**

“Good Morning, Fellow Quabbinites. As you know, the Quabbin Quest is an endurance race in which you and your teammate will traverse a challenging course using several modes of transportation. Be ever mindful that all traffic laws and safety procedures must be followed throughout the contest. You must remain on course at all times. Any attempt to take a shortcut or any violation of rule or law will result in your team being disqualified.

“You will now be given a highway map, three USGS quads, and a set of questions that you are required to answer to familiarize yourselves with the course and qualify for further participation. The various modes of transportation you will be required to use are described in this exam. You will be given 50 minutes to answer all questions. Those teams achieving a ranking within the upper 50% will qualify for participation in this thirtieth run of the Quabbin Quest! You may begin.”

The race will begin at Center School in the small town of Hatfield, MA, appearing in the upper left-hand corner of the **Mount Holyoke** Quadrangle. After launching your canoes into the Connecticut River, you will paddle Southward to Hockanum Flat.

1. **[MH]** When was this quadrangle last photorevised?
2. **[MH]** What series is this quad?
3. **[MH]** Note the number 696000m E in the upper left-hand corner of the quad. This number is part of a grid system often abbreviated as UTM. What words do the letters of that abbreviation represent?
4. **[MH]** To what scale is this map drawn?
5. **[MH]** How many feet are represented by each inch on this quadrangle?

6. [MH] In which county is Center School located? [Hint: The county boundary lies within the Connecticut River.]
7. [MH] In which sector of this quad is the small town of Hatfield located?
8. [MH] How is the Connecticut River's direction of flow indicated on this quad?
9. [MH] Are the banks of the Connecticut River, at this location, **greater than** or **less than** 120 feet in elevation?
10. [MH] Locate the long, narrow contour line sporting short, inward pointing lines called hatchures South of Center School. What is this special type of contour called?
11. [MH] How can you determine from this quad that the rate of flow in this stretch of the Connecticut River is very slow?
12. [MH] Over time, the meandering Connecticut River changed course forming a small horseshoe-shaped lake near Hockanum Flat, lying adjacent to but separate from, the river itself. What term refers to a lake formed in this manner?
13. [MH] From Hockanum Flat, you will travel by moped to the Dry Brook Hill Landing Strip. The first road you will encounter appears on the quad as a series of broken, double-lined [=====] symbols leading in a Northeasterly direction. What class road is represented by this symbol?
14. [MH] What class road is State Route 47?
15. [MH] What natural barrier would have made it difficult to transfer from canoe to moped had those individuals who laid out the course chosen to culminate the canoe portion of the race at the southwestern end of the landing strip?
16. [MH and WD] From the Northeastern tip of Dry Brook Hill Landing Strip, participants will travel via hot air balloon to the flat area a short distance south of Miner Road [E sector of the Winsor Dam Quad]. List the quads representing the areas over which you will pass, in order, from take-off to landing.
17. [MH] Once in the air, you may make radio contact with the tower located on Bare Mountain [E Sector, Mt. Holyoke Quad]. State the **bearing** from the NE tip of the landing strip to the radio tower on Bare Mountain?
18. [WD] What kind of survey control mark, located at the center of your destination, indicates an elevation of 765 feet?

19. [WD] Determine and record the coordinates of the Southwestern corner of the sector in which your hot air balloon is to land.
20. [WD] At this landing point, two mules will be awaiting you. You will hop onto your mules and ride Northward on the short, unimproved road, turn left onto Miner Road, continue westward along the jeep trail, and cross a small stream called Flat Brook. Is this stream classified as **intermittent** or **perennial**?
21. [WD] At this point, does Flat Brook flow in a **Northerly** or **Southerly** direction?
22. [WD] After crossing the stream, you will continue along the jeep trail, turn South onto a private road, turn onto Fisherdick Road, and continue riding Southward until you come upon State Route 9. Approximately how far, in miles, is Worcester, MA, from the intersection of Fisherdick Road and State Route 9?
23. [WD] You will then turn right onto Route 9. You will soon pass near Winsor Dam. What is the maximum water height this dam will permit before water begins to cascade over its spillway?
24. [B] What kind of survey control mark is located at the intersection of State Routes 9 [Ware Road] and 21 near Belchertown?
25. [B] From this intersection the town's water tower [WT], located one block East of Main Street, may be seen. State the **azimuth** to that water tower.
26. [B] From this intersection, you will ride Southwest along State Route 21 and US Route 202 to the railroad tracks. As you look to the right, you will spot your next form of transportation, a sidecar that runs on rails and moves as two individuals pump a long teeter-totter type lever mounted onto its bed. You may have seen these antiquated vehicles in cartoons. What name is given to a section of multi-railed tracks such as those found to the right of your present location?
27. [B] At this point you will abandon your mule and hop onto a sidecar. You will pump your way Northward until you reach Bay Road. How many kilometers will you travel by rail? [Answer to the nearest tenth of a kilometer.]
28. [B] Over what kind of railroad track will you be traveling during the latter half of your sidecar journey?
29. [B and MAHP] When you reach Bar Road, you will abandon your sidecar, jump onto a Harley, and head West. You will turn right onto Stebbins Street that soon turns to School Street. Upon reaching US Route 202, you will head East to Granby. What is the population of Granby?

30. [MAHP] What year was the census used in determining the population of Granby taken?
31. [MAHP] Letter-number coordinates are used to help one easily locate a town or city on a highway map. What letter-number coordinate assists in locating the town of Granby on the highway map?
32. [MAHP] You will continue on to Holyoke along US Route 202. A short distance beyond Holyoke you will turn north onto Interstate 91. What number identifies the interchange onto which you will turn?
33. [MAHP] How far North, stated in miles, must you travel before arriving at the I-91/State Route 2 intersection?
34. [MAHP] Are restrooms available at any of the rest stops along the stretch of I-91 through which you will be traveling?
35. [MAHP and WD] Upon reaching the I-91/State Route 2 intersection, you will exit and head East on Route 2 to Route 202 South. At the Northernmost tip of the Western branch of Quabbin Reservoir, you will abandon your Harley and hop onto a speedboat. You will round Prescott Peninsula and land anywhere along the beaches of Little Quabbin. What is a “peninsula”?
36. [WD] One final mode of transportation must be used to complete the Quabbin Quest -- an ascent to the highest point on Little Quabbin Island. What is the only available mode of transportation to reach that point?

“Okay, Ladies and Gentlemen. Turn in your response sheet for evaluation. You will soon discover whether your knowledge and expertise at interpreting maps have earned you the privilege of participating in the actual running of this year’s Quabbin Quest!”

## The Quabbin Quest

## Answer Key

- 1 1979
- 2 7.5 minute
- 3 Universal Transverse Mercator
- 4 1:25,000
- 5 2083 feet
- 6 Hampden County
- 7 NW [or 1]
- 8 Short, blue arrows imprinted on the river
- 9 Less than
- 10 Depression contours
- 11 Only one contour line crosses the river its entire length through this quad.
- 12 Oxbow
- 13 Unimproved dirt
- 14 Heavy-duty [or Primary highway]
- 15 Steep bank
- 16 Mt. Holyoke, Belchertown, Winsor Dam [must be in this exact order]
- 17 N 60° E [ $\pm 5^\circ$ ]
- 18 Spot elevation
- 19 42° 17' 30" N 72° 17' 30" W
- 20 Perennial
- 21 Southerly
- 22 31.5 miles [ $\pm 0.5$ ]
- 23 524 feet
- 24 Horizontal control
- 25 240° [ $\pm 5^\circ$ ]
- 26 Juxtaposition
- 27 3.6 km [ $\pm 0.5$  km]
- 28 Standard gauge single track
- 29 1327
- 30 1990
- 31 F-8
- 32 # 16
- 33 11 miles
- 34 No
- 35 An area of land nearly surrounded by water or jutting out into the water
- 36 Hiking [or similar]

To purchase a set of USGS quads and highway map to accompany this unit, please visit:  
<http://www.otherworlds-edu.com>

For an instructional lesson on how to read UTM Grids, visit the following web site:  
<http://www.nps.gov/prwi/readutm.html>

**The Quabbin Quest**

**Response Sheet**

Name[s]: \_\_\_\_\_

Note: Two lines are available for longer responses [8, 11, 16, 19, 28, 35].

- |           |           |
|-----------|-----------|
| 1. _____  | 19. _____ |
| 2. _____  | _____     |
| 3. _____  | 20. _____ |
| 4. _____  | 21. _____ |
| 5. _____  | 22. _____ |
| 6. _____  | 23. _____ |
| 7. _____  | 24. _____ |
| 8. _____  | 25. _____ |
| _____     | 26. _____ |
| 9. _____  | 27. _____ |
| 10. _____ | 28. _____ |
| 11. _____ | _____     |
| _____     | 29. _____ |
| 12. _____ | 30. _____ |
| 13. _____ | 31. _____ |
| 14. _____ | 32. _____ |
| 15. _____ | 33. _____ |
| 16. _____ | 34. _____ |
| _____     | 35. _____ |
| 17. _____ | _____     |
| 18. _____ | 36. _____ |

Total number of correct responses: \_\_\_\_\_