ASTEROID PREDICTION TRICKS

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Someone chooses a letter from the word ASTEROID, and your task is to ask questions until you can identify the chooser's letter. If the questions are of the form "which of the following two words contains your letter?", two are sufficient for identification:

Question 1: which of the following two words, TADS or TROD, contains your letter?
Question 2: which of the following two words, RIDS or DIET, contains your letter?

The responses must be one of the following: the left word (L), both words (B), neither word (N) or the right word (R). To make things harder, we allow the chooser to select one of two quirks--the Convivial or the Contrary. If the Convivial, the chooser always tells the truth about his letter's location; if the Contrary, he consistently reverses right and left, and also both and neither.

Asteroid 1 (ignoring the bottom L R L R and "CONFUSABLES" for the moment) shows a mnemonic grid that identifies the chosen letter. The entry in the row and column identifies the choice: for example, an answer of "both" to Question 1 and "right" to Question 2 (1B, 2R) shows the chosen letter is T. The + shows that the chooser is Convivial (if -, Contrary).

We can make the task even more difficult by allowing a third quirk, the Confused. A Confused chooser will alternate between Convivial and Contrary in his answers, starting in whichever state he wishes. If we allow all three quirks, then after two questions we will be undecided among the following pairs of confusables: ID, OA, SR, ET. A third question is needed:

Question 3: which of the following two words, SOAR or EDIT, contains your letter?

The answers L R L R on the bottom of the mnemonic grid are what should occur if the chooser is NOT confused. If the opposite occurs, the chooser IS confused and has selected the confusable mate instead. For example, 1B 2R 3L indicates a confused E (he started with a lie), while 1B 2R 3R indicates a convivial T.

Since there are eight letters in ASTEROID, and since we can lie or tell the truth about any one of them, there are sixteen possibilities to be

decided among. Our two questions, each with four responses, produce sixteen alternatives--just enough to decide the matter. For the added Confused quirk, we need to choose among 32 states. Thus, our third question needs only two responses to succeed.

Another (perhaps easier) set of questions is posed below:

Question 1: in how many of the words DIOR, RAID, SAID does your letter appear?
Question 2: in how many of the words RIDE, SIRE, ROSE does your letter appear?
Question 3: in how many of the words RIOT, ADES, TOAD does your letter appear?

If the chooser decides to be Contrary, he will count the number of words his letter does NOT appear in and report that number instead. He can also be Confused and alternate his answers between Convivial and Contrary.

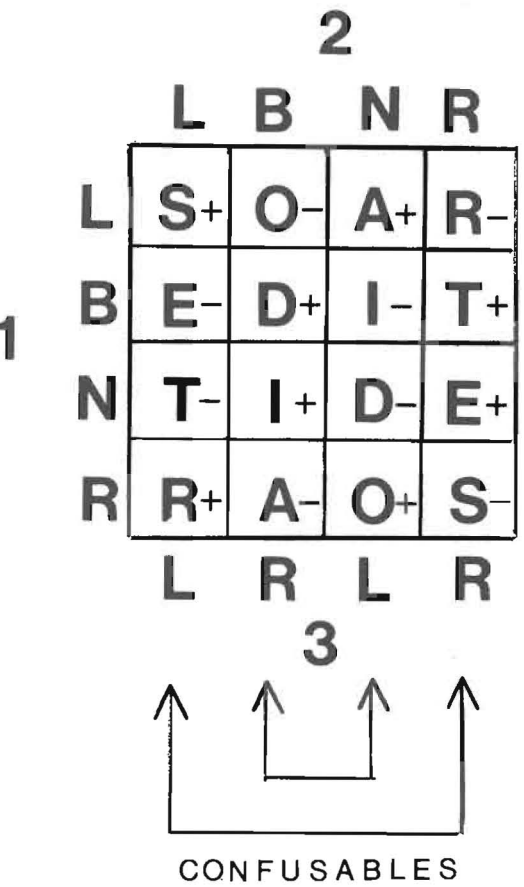
Asteroid 2 shows the corresponding mnemonic grid. For example, suppose the answers to the three questions are 2 words, 1 word and 1 word. The first two (2 words, 1 word) indicate a contrary S in the grid, but a contrary S would answer "2 words" to Question 3, so the chooser must have been Confused and has selected the letter O instead. The confusable pairs for Asteroid 2 are: ID, ET, SO, RA.

Finally, consider the following set of questions:

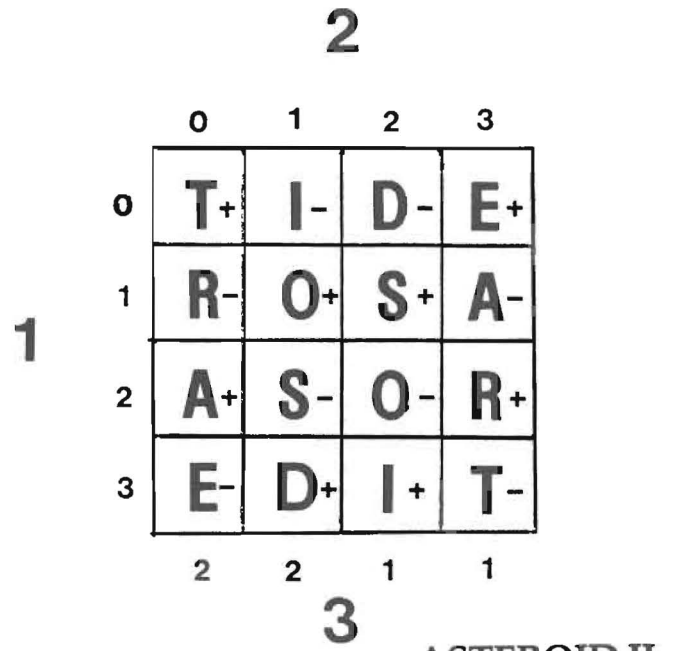
Question 1: is your letter in the word TRIO?
Question 2: is your letter in the word RAID?
Question 3: is your letter in the word TIDE?
Question 4: is your letter in the word RATE?
Question 5: is your letter in the word TOES?

The answers are "yes" or "no", and any of the three quirks is allowed. After four questions, the Asteroid 3 mnemonic grid enables us to zero in on a particular letter or its confusable: IT, AS, OR, ED. For example, if the first four responses are yes,yes,no,no, then we either have E- or its confusable D. E- indicates a contrary E, and such a chooser would respond "no" to Question 5. Therefore, if the answer to Question 5 is "yes", the chooser is confused and has selected D. Some other examples: (1) yes,no,yes,no,yes = contrary A; (2) yes,no,yes,no,no = confused S (he started with a lie); (3) no,no,yes,yes,yes = convivial E; (4) no,no,yes,yes,no = confused D (he started with the truth).

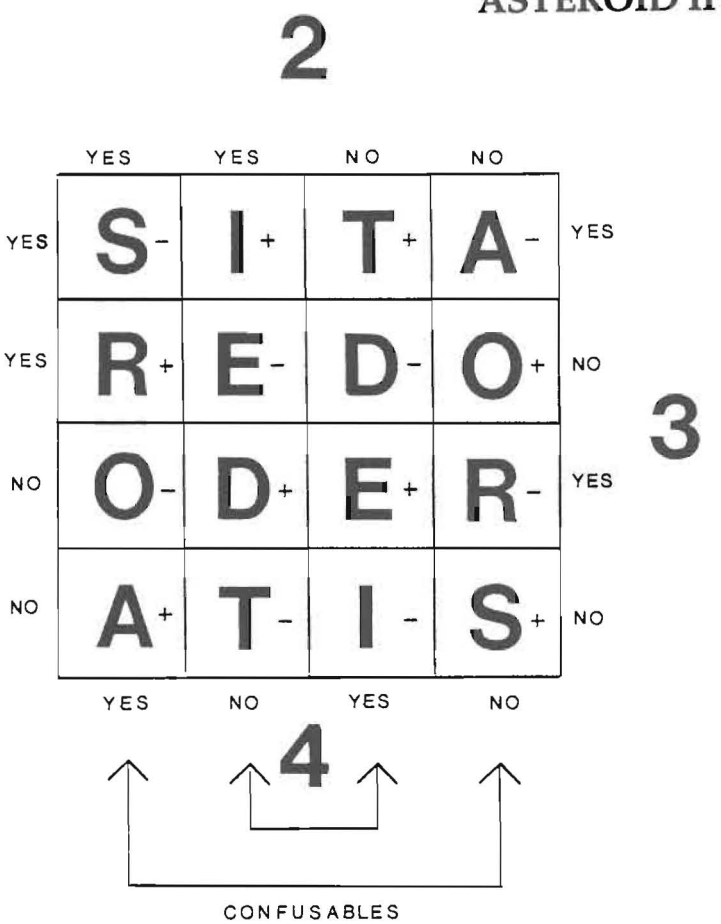
This prediction game may remind the reader of the base 2 number predictor cards often found as premiums in cereal boxes (tell which of the cards labeled 1,2,4,8... contains your number, which appears on all cards participating in its base 2 expansion). We like our word game much better since it allows lying, and thus tends to be more baffling.



ASTEROID I



ASTEROID II



ASTEROID III