

SCORE – Sort out the cows



- 1) Building a sorting network that finds the smallest and people can walk on it and demonstrate understanding of the blue gates.
- 2) Team has a strategy to demonstrate their network works and find the largest cow on 3 rails.
- 3) Team can find the largest and smallest cow on 3 rails and have a plan to build a sorting network for 4 gates.
- 4) All team members can play the role of the cows and use tie height to find who is the smallest and who is the shortest.
- 5) The can convince the instructor their network finds the largest cow (the largest cow is in a pre-determined rail no matter the initial order)
 - a. Find the smallest cow.
 - b. Find the smallest and the largest cow, not necessarily sorting.
 - c. Give the first problem solving set of exercises
 - i. Can gates that do not cross rails solve the above questions?
 - ii. What is a plan to check that the network is correct?
 - iii. If there are 5 rails, would it be possible to find the smallest cow with 3 rails, why yes or why no? In general, if there are n rails, is it possible to find the largest cow with $n-2$ or fewer gates?
- 6) Team can construct a legal network with ribbons on a mat. Team can do step 5 above for 4 rails. Team can describe a plan.
- 7) Team can scale up to 6, 7 or 8 rails using ribbon and the white mat for the problems of step 5)
 - a. With gates only between adjacent rails
 - b. With gates that jump over rails.
- 8) Team can describe how other gates may be useful, for what types of problems.
- 9) Team can sort the cows from largest to smallest.
- 10) Additional points for additional achievements
- 11) Additional points for additional activities.