The Viking Sword
By Nova/National Geographic

1. What is the name of the special sword used by the Vikings? Ulfberht
2. T F It's not all about a sharp edge on a sword.
3. What kind of steel was the Ulfberht sword made of? Pure steel
4. What weapons did most Viking warriors use? Axes and spears
5. What combination of properties gave the Ulfbert sword advantage? Strength, lightness, and flexibility.
6. Where are many Viking swords found? In rivers and burial sites.
7. (7:38) What does the blacksmith mean when he says, "It's not that I can't do anything else, but I can't do anything else (with emphasis)? He loves making swords and he's very good at it.
8. Is the blacksmith making a print first? Yes
9. What do you think reverse engineer means? Take an old sword and figure out how to make it
10. What needs to be added to iron (Fe) to turn it into steel? Carbon
11. What else can weaken the iron or steel? Slag
12. What was the old-fashioned way to remove slag? Hammering
13. What did the Professor Williams discover? The Ulfberht swords were made differently. There was no slag in the steel.
14. What is the name of the high-carbon steel discovered? Crucible steel
15. What property did the Ulfberht sword have that was good for the style of fighting? Flexibility
16. What does carbon do to iron? It hardens it?
17. What else does the blacksmith add? Sand (silicon).
18. Why? Because it cleans the impurities away.
19. Why is the crucible sealed? To make sure extra carbon doesn't get in.
20. How hot does the oven need to get? 3000 degrees F.
21. Why does it need to get to that temperature? To separate the slag out.
22. What other steel used crucible steel? Damascus steel
23. How could the Vikings travel to Iran? By rivers and lakes on boats
24. Where was the oven discovered that the blacksmith used? At the end of trade route in central Asia.
25. What is the name for the metal that came out of the crucible? Ingot
26. How long will the blacksmiths need to hammer the ingot into a bar? Eight hours
27. What force did the test put on the tested steels? It was pulling the steel.
28. What does the microscope show? Very little slag
29. How many hours did they hammer the steel? 11 hours
30. What changed about the shape of the Ulfberht sword. The tip was sharper.
31. Why did the old blacksmith put the name Ulfberht on the swords? We don't really know.
32. What is the indentation down the center of the blade? Fuller
33. T F The fuller allows for longer blades which are lighter in weight.
34. What is the riskiest part of the sword making? The quench
35. What does the blacksmith quench the blade in? Oil
36. What did the other professor find? Fakes

37. How long does it take to polish a sword? Several days
38.
39.