

# MOSS SIMPLE VERSION

	<b>THE SECRETE LIFE OF MOSSES</b>	
VOICE	IMAGES	REEL
1. Forests are dominated by large plants that crowd one another in their competition for light.	BUSH: Moss tape, 01:07 -07:15 View of bush with tree ferns from above with pan to the right. <u>Reel 2 03:20 - 03:42</u> (sun out, pan ends up in stream below) OR <u>07:08 - 07:30</u> (sun in but does not end up in stream)	LJ004 04:03:14:06 04:03:36:17
2. But far below, there is a group of tiny plants that successfully live and thrive on the floor of the forest.  These are the mosses.	BUSH: original video of valley Cross fade to a view up a stream; Camera moves down stream to boulder.	LJ008 9sec 20:23:10- 20:23:19 or 20:23:53- 20:24:03
3.	BUSH: 07:26 - 07:36 Moving in close to boulder with a clump of moss nearby.	LJ008- 20:25:40- 20:25:50
4.	<b>Animation:</b> Going into a clump of moss stems 01:43 - 01: 53	Moss Anim Master 00:11:54- 00:12:39
5.		
6. The small and compact form of most mosses enable the delicate stems to stay upright.....while small filaments anchor them to the soil.	Bush: Moving in close to boulder with a clump of mosses nearby.	
7. Moisture easily accumulates around the densely spaced stems.	02:07 to 02:12	
8. This often leaves a film of water on the leaves and on the stem tip.	Camera climbs to the top of a stem. 02:13 to 02:18	

9.		
10. Some stem tips are male and have finger like reproductive structures that contain sperm.	<b>Animation: 02:15 - 02:25</b> Fade-in to scene where camera is moving up the stem and inside water drop to see antheridia group.	MOSS ANIMATION MASTER 00:12:25 00:12:35
11.		
12.		
13. Other stem tips are female and have numerous flask shaped reproductive structures, each of which contain a single egg.	GREENHOUSE <b>Reel 5a 27:52 to 28:04</b>  Zoom into a stem tip.	LJ005 05:27:52:00 05:27:58:04
14..		
15.		
16.	Moving inside water drop.	LJ005 05:26:40:03- 05:26:45:04

17		
18		
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22.		
23.		
24. A rain shower provides the ideal conditions for sperm release and their transfer to a female plant.	<b>GREENHOUSE</b> Moss stems in rain.	
24a. Droplets of water collect at the tips of the moss stems.	<b>Animation</b>	
25. Inside the drop of water at the tip of the male stem, the reproductive structures open.	<b>Animation</b>	
26. This releases cells containing sperm....which float up to the surface.	<b>Animation</b>	
27.		
28. Rain drops splash some of this water out of the male plant.	<b>Animation</b>	
29. Some splash drops contain sperm cells and fall onto the tip of a female stem.		
30. The sperm now escape from their surrounding membrane, .....and use their flagella to move about in search of an egg.	<b>Animation: 04:12 - 04:22</b> Membrane around sperm breaks down.	

31	<b>Animation: 04:23 - 04:29</b> Sperm begin swimming movement.	
32.		
33. The egg case now opens and releases a chemical that attracts the sperm. .	<b>Animation: 05:24 - 05:44</b> Camera moving up neck. (up close) Tip cells open, releasing attractant.	MOSS ANIMATION MASTER 00:18:32 00:19:24
34. Sperm swim towards the source of the attractant and into the opening .	<b>Animation: 05:45 - 05:58</b> Sperm swimming towards the opening of the archegonium	
35. Once inside, they are guided down to the egg.	<b>Animation: 05:59 - 06:08</b> Sperm swimming down inside the archegonium to the egg	
36. The first sperm to arrive enters the egg cell.	<b>Animation: 06:09 - 06:20</b> Fertilisation	
37. Fertilisation is completed when the sperm and egg nuclei fuse.	<b>Animation</b>	
38. After fertilisation, many changes take place on the tip of the female stem.	GREENHOUSE: Real stem tip (Delete scene)	LJ005 05:26:14:15- 05:26:21:16
39. At first, the fertilised egg remains within its protective chamber where it forms an embryo.	<b>Animation 04:40 - 04:46</b> Repeat view of entire female shoot tip; then a single archegonium, external view .	MOSS ANIMATION MASTER 00:17:47- 00:17:55 slow to half?
40.	Animation Internal view: enlarging embryo.	MOSS ANIM MASTER 00:20:26- 00:20:30
41. One end of the embryo grows down, firmly attaching itself to the female stem.		
42. This allows it to obtain water and nutrients from the female plant.		
43. Meanwhile, the other end of the embryo grows up.		
44. The egg chamber expands to accommodate this growth....but eventually it splits in half.		

45.	<b>Animation 07:30 - 07:37</b> Archegonium breaking in half	MOSS ANIM MASTER 00:20:30- 00:20:37
46. . The embryo now forms a very long stalk that lifts the top half of the egg chamber up into the air.	<b>Animation 07:39 - 07:45</b> The top half is lifted upwards	MOSS ANIM MASTER 00:20:52- 00:20:58
47. This creates a small plant attached to the tip of the female stem.	<b>Greenhouse:</b> small group of sporophytes with finger.	
48. These female stems have all been fertilised and support small plants above them.	Group of living moss sporophyte plants	
49. The tip of each plant is covered by the torn egg chamber.	Up close of a few sporophyte plants.	
50. This soon falls away exposing a capsule or spore case.	Shell falling off exposing the capsule.	
51. The capsule contains fertile tissue consisting of spore producing cells.	Animation: Capsule	
52-57.		
58. As it matures, the capsule dries out and the lid falls away revealing a ring of fine teeth.	Lid of capsule falling away.	
59.		
60. These surround an opening in the capsule. As they dry out, they bend backwards, allowing the spores to escape.	Peristome teeth bending.	
61. 62. A light breeze is all it takes to carry the spores away from the parent plant.	Group of sporophytes, spore clouds being spread by the wind.	
63. Spores, carried by the wind, may land on an exposed surface.	Spore landing.	
64. After rain, the spore cell absorbs water and germinates.	Spore germinating	
65. But instead of growing into a new moss plant, it forms a series of fine, branching filaments.	Protonema filament forming	
66. After a period of growth, some of the filaments form buds.	Bud forming	
67. Each of these buds will proceed to grow into a new moss plant.		
68. Spores therefore, enable mosses to spread and colonise new areas, often some distance from the parent plant.		

FINALE		
<p>Using both gametes and spores, these unassuming members of the plant kingdom quietly proceed to thrive and multiply.</p> <p>They have successfully spread from polar regions to the tropics, and are equally at home in our cities or in the countryside.</p> <p>Perhaps a key to the success of mosses is their small size.</p> <p>Perhaps it is due to their ancient lineage, going back more than 400 million years to a time when plants were first colonising the land.</p> <p>Whatever the reason, these tough, yet attractive opportunists hold many surprises for the interested observer.</p>		