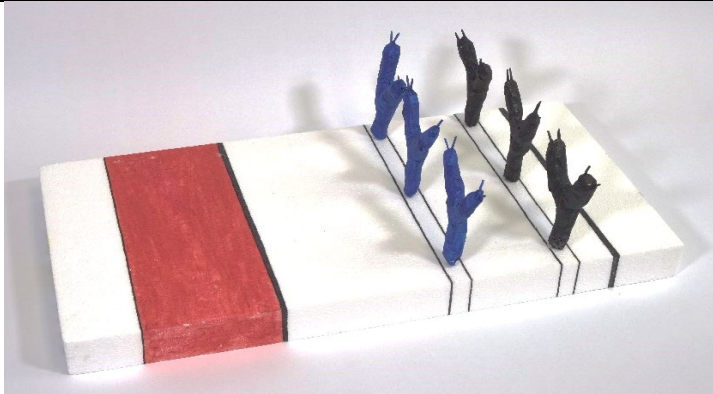# Antigen rapid test model

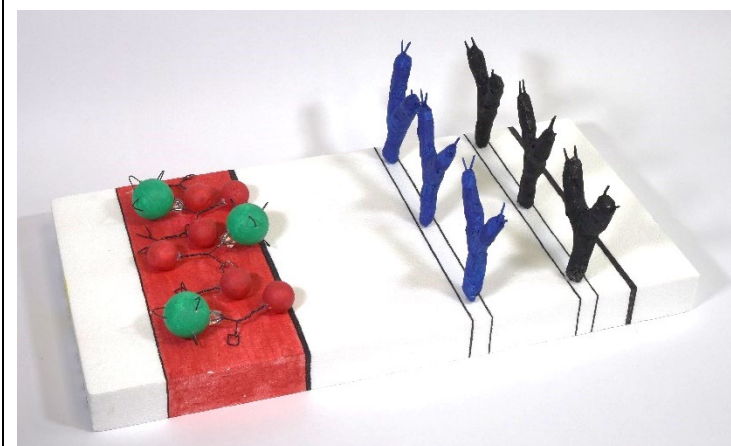| Picture of model	Scientific background	Activity
	The test straight out of the packaging.	Stage 1 of the model is provided already made by the teacher.
		The students place the labelling cards next to the corresponding parts of the model.

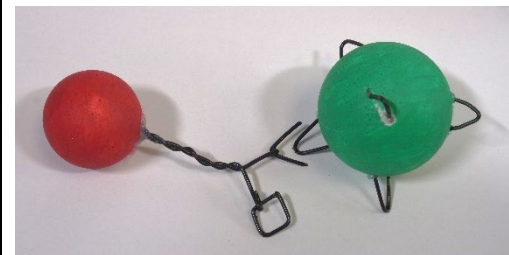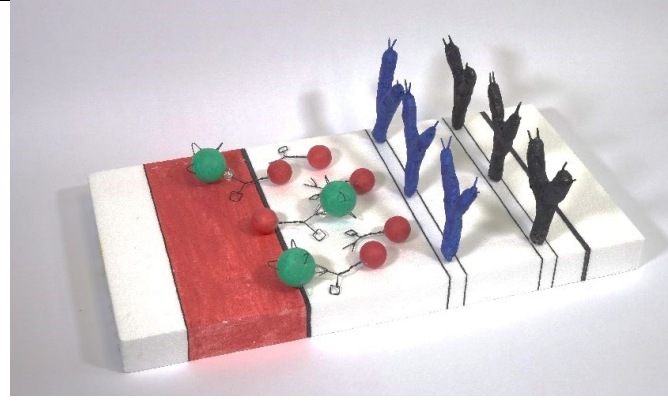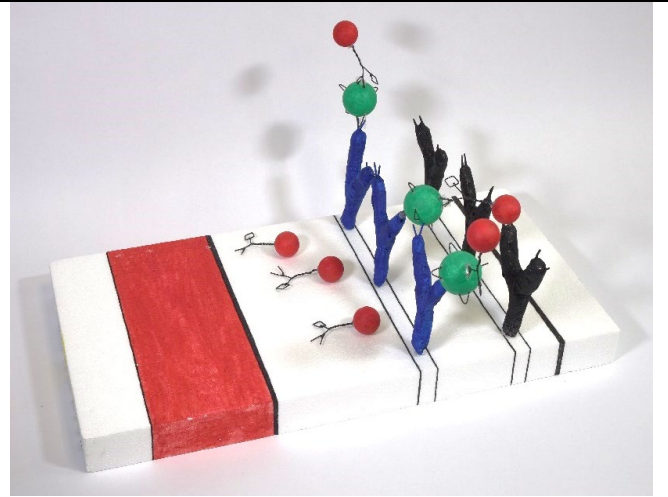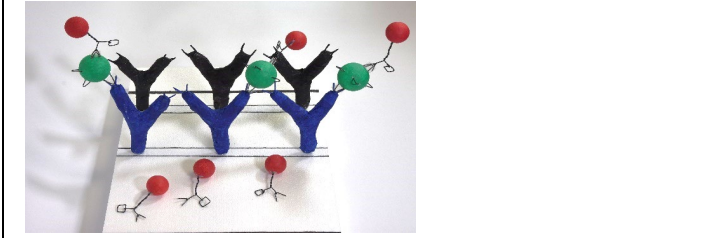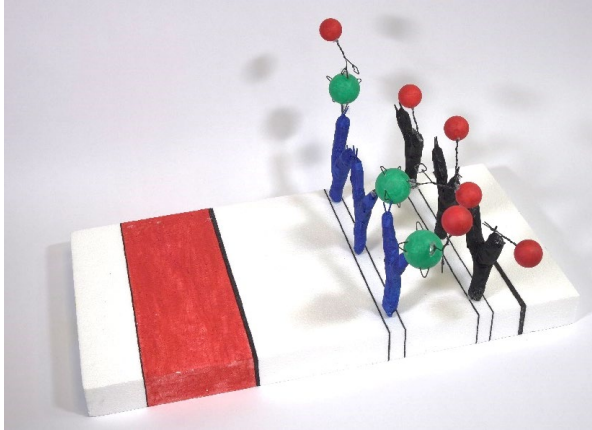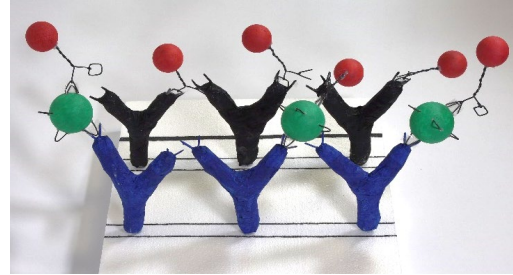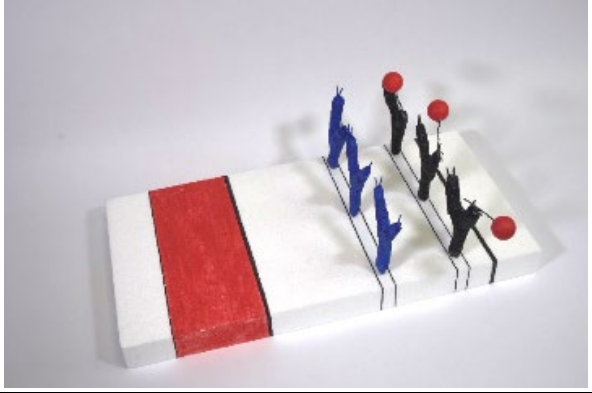|	Run through the model for a positive test		
	When a test is performed, the sample is added to the sample pad. It serves as a preliminary filter to eliminate pollutants from the applied sample. In some tests, the sample pad already contains a buffer solution that can be released to achieve the ideal pH level of the immunological reaction. In the case of infection, the sample contains coronavirus. Antigens (exogenous proteins) are located on their surface.	The students move the coronavirus particles onto the sample pad.	
	The sample migrates through the sample pad, reaching the conjugate pad, which contains antibodies connected to colloidal gold (red colour), the so-called antibody–gold complex. This antibody–gold complex binds to the antigens of the coronavirus particles, if present in the sample. 	The students connect (hold) the coronavirus particles to the antibody–gold complex.	
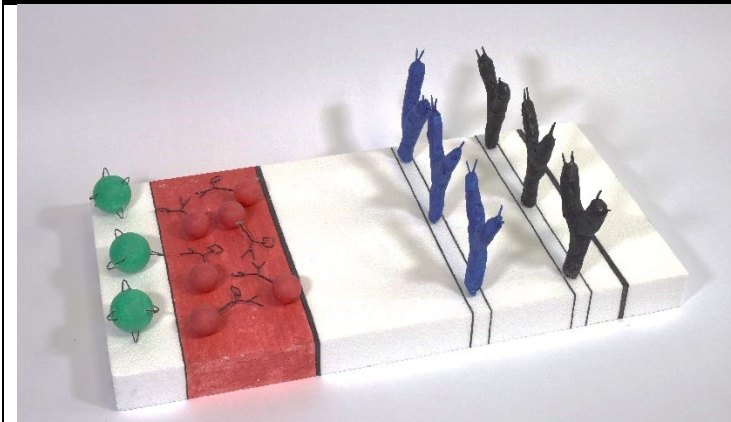
	The sample carries the antigen–gold complexes (with or without bound virus) to the next section of the test.	The students place the coronavirus particles that are now connected to the antibody–gold complex slightly closer to the antibodies.
The next section is called the reaction matrix, in which the test line and control line are located. Here, specific biological components are immobilized and laid down in bands.		
	The test line of a COVID-19 test contains immobilized antibodies that specifically bind to the antigens of the coronavirus particles. In the case of infection, these test-line antibodies capture the virus particles with the bound antibody–gold complexes, which gives a red line on the test. 	The students move the virus–antibody–gold complexes to the antibodies on the test line.

	The control line of a COVID-19 test contains immobilized antibodies that specifically bind to the antibody–gold complex. Since the antigen–gold complexes are used in excess, they always reach the control line and show a red line. If this is not the case, the test is invalid. 	The students connect the remaining antibody–gold complexes to the antibodies on the control line.

Run through the model for a negative test

	In the case of a negative test outcome, the sample does not contain coronavirus, and the antibody–gold complexes can only connect to the control line.	The students can go through the test once again but without the coronavirus particles in the sample.

Images courtesy of the authors