



## iStage 2: Smartphones in Science Teaching / Smartphones im naturwissenschaftlichen Unterricht

**Apps and further resources / Liste der Apps und  
weiterführende Materialien**

**Apps (last update 01.12.2014):**

Name	Operating System	Price	Link
Adidas Snapshot	iOS	free	<a href="https://itunes.apple.com/de/app/adidas-snapshot/id654671976?mt=8">https://itunes.apple.com/de/app/adidas-snapshot/id654671976?mt=8</a>
Accelerometer Monitor	Android	free	<a href="https://play.google.com/store/apps/details?id=com.lul.accelerometer">https://play.google.com/store/apps/details?id=com.lul.accelerometer</a>
Accellogger	Android	free	<a href="https://play.google.com/store/apps/details?id=jp.daikiko.Accellogger">https://play.google.com/store/apps/details?id=jp.daikiko.Accellogger</a>
Angle and slope measurement	Android	free	<a href="https://play.google.com/store/apps/details?id=kr.sira.protractor">https://play.google.com/store/apps/details?id=kr.sira.protractor</a>
Angle meter	iOS	free	<a href="https://itunes.apple.com/de/app/angle-meter-free/id436775826?mt=8">https://itunes.apple.com/de/app/angle-meter-free/id436775826?mt=8</a>
Audio Spectrum Analyzer	Android	free	<a href="https://play.google.com/store/apps/details?id=com.xyz.fft">https://play.google.com/store/apps/details?id=com.xyz.fft</a>
British Birds Lite	iOS	free	<a href="https://itunes.apple.com/de/app/british-birds-lite/id332733801?mt=8">https://itunes.apple.com/de/app/british-birds-lite/id332733801?mt=8</a>
Color Grab	Android	free	<a href="https://play.google.com/store/apps/details?id=com.loomatix.colorgrab">https://play.google.com/store/apps/details?id=com.loomatix.colorgrab</a>
ColorAssist Free Edition	iOS	free	<a href="https://itunes.apple.com/de/app/colorassist-free-edition/id495034867?mt=8">https://itunes.apple.com/de/app/colorassist-free-edition/id495034867?mt=8</a>
Compass	Android	free	<a href="https://play.google.com/store/apps/details?id=com.gn.android.compass">https://play.google.com/store/apps/details?id=com.gn.android.compass</a>
Compass	iOS	free	<a href="https://itunes.apple.com/de/app/compass-for-ipad-free/id378640003?mt=8">https://itunes.apple.com/de/app/compass-for-ipad-free/id378640003?mt=8</a>
DigiPro Spectrum	Android	1,00 €	<a href="https://play.google.com/store/apps/details?id=b4a.digipro">https://play.google.com/store/apps/details?id=b4a.digipro</a>

Analyzer			
Distance and Parallax	Android	free	<a href="https://play.google.com/store/apps/details?id=com.alextooma.DistanceAndParallax">https://play.google.com/store/apps/details?id=com.alextooma.DistanceAndParallax</a>
Decibel Meter	Android	free	<a href="https://play.google.com/store/apps/details?id=cn.menue.decibelmeter">https://play.google.com/store/apps/details?id=cn.menue.decibelmeter</a>
Decibel Ultra	iOS	free	<a href="https://itunes.apple.com/de/app/decibel-ultra/id410139517?mt=8">https://itunes.apple.com/de/app/decibel-ultra/id410139517?mt=8</a>
Distance and Height	Android	free	<a href="https://play.google.com/store/apps/details?id=com.alextooma.distanceandheight">https://play.google.com/store/apps/details?id=com.alextooma.distanceandheight</a>
Distance measurement	Android	free	<a href="https://play.google.com/store/apps/details?id=kr.sira.distance">https://play.google.com/store/apps/details?id=kr.sira.distance</a>
Easy Measure	iOS	free	<a href="https://itunes.apple.com/us/app/easymeasure-measure-your-camera!/id349530105?mt=8">https://itunes.apple.com/us/app/easymeasure-measure-your-camera!/id349530105?mt=8</a>
FFT Spectrum Analyzer	Android	free	<a href="https://play.google.com/store/apps/details?id=com.xyz.fft">https://play.google.com/store/apps/details?id=com.xyz.fft</a>
FrequenSee	Android	free	<a href="https://play.google.com/store/apps/details?id=com.DanielBach.FrequenSee">https://play.google.com/store/apps/details?id=com.DanielBach.FrequenSee</a>
Google Maps	Android	free	<a href="https://play.google.com/store/apps/details?id=com.google.android.apps.maps">https://play.google.com/store/apps/details?id=com.google.android.apps.maps</a>
Google Maps	iOS	free	<a href="https://itunes.apple.com/de/app/google-maps/id585027354?mt=8">https://itunes.apple.com/de/app/google-maps/id585027354?mt=8</a>
GPS Essenials	iOS	1,79 €	<a href="https://itunes.apple.com/de/app/btopomaps-gps-essentials/id593977208?mt=8">https://itunes.apple.com/de/app/btopomaps-gps-essentials/id593977208?mt=8</a>
Height and Distance	iOS	1,79 €	<a href="https://itunes.apple.com/de/app/too-big-too-far-height-distance/id372117409?mt=8">https://itunes.apple.com/de/app/too-big-too-far-height-distance/id372117409?mt=8</a>
Height and Pressure	Android	free	<a href="https://play.google.com/store/apps/details?id=com.alextooma.heightmeasurement">https://play.google.com/store/apps/details?id=com.alextooma.heightmeasurement</a>
iAnalyzer lite	iOS	free	<a href="https://itunes.apple.com/de/app/ianalyzer-lite/id342456044?mt=8">https://itunes.apple.com/de/app/ianalyzer-lite/id342456044?mt=8</a>
ISS Detector	Android	free	<a href="https://play.google.com/store/apps/details?id=com.runar.issdetector">https://play.google.com/store/apps/details?id=com.runar.issdetector</a>
iRig Recorder	Android	free	<a href="https://play.google.com/store/apps/details?id=com.ikmultimediaus.android.irigrecorder">https://play.google.com/store/apps/details?id=com.ikmultimediaus.android.irigrecorder</a>
iRig Recorder	iOS	3,59 €	<a href="https://itunes.apple.com/de/app/irig-recorder/id428498084?mt=8">https://itunes.apple.com/de/app/irig-recorder/id428498084?mt=8</a>
Magnetic Field Detecor/Sensor	Android	free	<a href="https://play.google.com/store/apps/details?id=com.go.magneticsensor">https://play.google.com/store/apps/details?id=com.go.magneticsensor</a>
Magnetometer	iOS	free	<a href="https://itunes.apple.com/de/app/magnetometer/id342782714?mt=8">https://itunes.apple.com/de/app/magnetometer/id342782714?mt=8</a>

My Altitude	iOS	free	<a href="https://itunes.apple.com/de/app/my-altitude/id465262694?mt=8">https://itunes.apple.com/de/app/my-altitude/id465262694?mt=8</a>
n-Track Tuner	Android	free	<a href="https://play.google.com/store/apps/details?id=com.ntrack.tuner">https://play.google.com/store/apps/details?id=com.ntrack.tuner</a>
Planetarium	Android	free	<a href="https://play.google.com/store/apps/details?id=com.andscaloid.planetarium">https://play.google.com/store/apps/details?id=com.andscaloid.planetarium</a>
Physics Toolbox Accelerometer	Android	free	<a href="https://play.google.com/store/apps/details?id=com.chrystianvieyra.android.physicstoolboxaccelerometer">https://play.google.com/store/apps/details?id=com.chrystianvieyra.android.physicstoolboxaccelerometer</a>
Physics Toolbox Roller Coaster	Android	free	<a href="https://play.google.com/store/apps/details?id=com.chrystianvieyra.android.physicstoolboxrollercoaster">https://play.google.com/store/apps/details?id=com.chrystianvieyra.android.physicstoolboxrollercoaster</a>
Regression Calculator	iOS	0,89 €	<a href="https://itunes.apple.com/de/app/regression-calculator/id339270826?mt=8">https://itunes.apple.com/de/app/regression-calculator/id339270826?mt=8</a>
Regression Calculator	Android	free	<a href="https://play.google.com/store/apps/details?id=com.bogeyman.regres-sionfree">https://play.google.com/store/apps/details?id=com.bogeyman.regres-sionfree</a>
Star Chart	iOS	free	<a href="https://itunes.apple.com/us/app/star-chart/id345542655?mt=8">https://itunes.apple.com/us/app/star-chart/id345542655?mt=8</a>
Star Chart	Android	free	<a href="https://play.google.com/store/apps/details?id=com.escapistgames.starchart">https://play.google.com/store/apps/details?id=com.escapistgames.starchart</a>
Sensor Export	Android	free	<a href="https://play.google.com/store/apps/details?id=com.heeposoft.sensor-export">https://play.google.com/store/apps/details?id=com.heeposoft.sensor-export</a>
Sensor Kinetics	Android	free	<a href="https://play.google.com/store/apps/details?id=com.innoventions.sen-sorkinetics">https://play.google.com/store/apps/details?id=com.innoventions.sen-sorkinetics</a>
Sensor Kinetics	iOS	free	<a href="https://itunes.apple.com/de/app/sensor-kinetics/id579040333?mt=8">https://itunes.apple.com/de/app/sensor-kinetics/id579040333?mt=8</a>
Sensor Kinetics Pro	Android	0,76 €	<a href="https://play.google.com/store/apps/details?id=com.innoventions.sen-sorkineticspro">https://play.google.com/store/apps/details?id=com.innoventions.sen-sorkineticspro</a>
Sensor Kinetics Pro	iOS	0,89 €	<a href="https://itunes.apple.com/de/app/sensor-kinetics-pro/id623633248?mt=8">https://itunes.apple.com/de/app/sensor-kinetics-pro/id623633248?mt=8</a>
Sensor Log	iOS	free	<a href="https://itunes.apple.com/us/app/sensorlog/id388014573?mt=8">https://itunes.apple.com/us/app/sensorlog/id388014573?mt=8</a>
Smart Compass	Android	free	<a href="https://play.google.com/store/apps/details?id=kr.sira.compass">https://play.google.com/store/apps/details?id=kr.sira.compass</a>
Smart Distance	Android		<a href="https://play.google.com/store/apps/details?id=kr.sira.distance">https://play.google.com/store/apps/details?id=kr.sira.distance</a>
Smart Measure	Android	free	<a href="https://play.google.com/store/apps/details?id=kr.sira.measure">https://play.google.com/store/apps/details?id=kr.sira.measure</a>
Smart Protractor	Android	free	<a href="https://play.google.com/store/apps/details?id=kr.sira.protractor">https://play.google.com/store/apps/details?id=kr.sira.protractor</a>
Solar Walk	iOS	0,89 €	<a href="https://itunes.apple.com/de/app/solar-walk-3d-sonnensystem/id347546771?mt=8">https://itunes.apple.com/de/app/solar-walk-3d-sonnensystem/id347546771?mt=8</a>

Sound Meter	Android	free	<a href="https://play.google.com/store/apps/details?id=com.bti.soundMeter">https://play.google.com/store/apps/details?id=com.bti.soundMeter</a>
Sound Spektrum Analyzer	Android	free	<a href="https://play.google.com/store/apps/details?id=sk.SSA_Free">https://play.google.com/store/apps/details?id=sk.SSA_Free</a>
SPARKvue	iOS	free	<a href="https://itunes.apple.com/de/app/sparkvue/id361907181?mt=8">https://itunes.apple.com/de/app/sparkvue/id361907181?mt=8</a>
SPARKvue	Android	free	<a href="https://play.google.com/store/apps/details?id=com.isbx.pasco.Spark">https://play.google.com/store/apps/details?id=com.isbx.pasco.Spark</a>
SpecScope Spectrum Analyzer	Android	free	<a href="https://play.google.com/store/apps/details?id=com.nfx.specscope">https://play.google.com/store/apps/details?id=com.nfx.specscope</a>
Spectrum Analyzer	Android	free	<a href="https://play.google.com/store/apps/details?id=sk.bielyvk.spectrumanalyzer">https://play.google.com/store/apps/details?id=sk.bielyvk.spectrumanalyzer</a>
Stellarium mobile	Android	free	<a href="https://play.google.com/store/apps/details?id=com.noctuasoftware.stellarium">https://play.google.com/store/apps/details?id=com.noctuasoftware.stellarium</a>
Stellarium mobile	iOS	1,79 €	<a href="https://itunes.apple.com/de/app/stellarium-mobile/id643165438?mt=8">https://itunes.apple.com/de/app/stellarium-mobile/id643165438?mt=8</a>
Theodolite	iOS	3,59 €	<a href="https://itunes.apple.com/de/app/theodolite/id339393884?mt=8">https://itunes.apple.com/de/app/theodolite/id339393884?mt=8</a>
Theodolit Droid	Android	free	<a href="https://play.google.com/store/apps/details?id=com.shopzeus.android.majorforms_1012">https://play.google.com/store/apps/details?id=com.shopzeus.android.majorforms_1012</a>
UK Bird Sounds	Android	free	<a href="https://play.google.com/store/apps/details?id=com.luminousapps.uk.birdsounds">https://play.google.com/store/apps/details?id=com.luminousapps.uk.birdsounds</a>
Vernier Video Physics	iOS	4,49 €	<a href="https://itunes.apple.com/de/app/vernier-video-physics/id389784247?mt=8">https://itunes.apple.com/de/app/vernier-video-physics/id389784247?mt=8</a>
VidAnalysis	Android		<a href="#">will be released in December 2014</a>
X-Sensor	iOS	1,79 €	<a href="https://itunes.apple.com/de/app/x-sensor/id340527664?mt=8">https://itunes.apple.com/de/app/x-sensor/id340527664?mt=8</a>

## Further resources

Tracker: <https://www.cabrillo.edu/~dbrown/tracker/>

Geogebra: <http://wiki.geogebra.org/>

**iSky: Smart Measurements of the Heavens / iSky: Die Vermessung des Himmels**

Instruction to build a device for measuring / Anleitung zum Bau eines Messgerätes:

<http://usuaris.tinet.cat/pcompte/mobile>

**Earth's Magnetic Field / Das Magnetfeld der Erde:**

Instruction to build a Helmholtz coil / Anleitung zum Bau einer Helmholtzspule

- *Coming soon* -

Moodle: <http://moodle.science-on-stage.com/mod/data/view.php?id=289>

Going for a song/

Alle Vögel sind  
schon da

<b>GENERAL RISK ASSESSMENT FORM</b>							
<b>a.</b> Dept assessment no (assigned by risk assessor)				<b>b.</b> Overall assessment no (to be assigned by H&S Manager)			
<b>c.</b> Date first prepared: 1 <sup>st</sup> March 2014				<b>d.</b> Prepared by: Richard Spencer			
<b>e.</b> Dates of previous reviews							
<b>f.</b> Date of this current reviewed version:				<b>g.</b> Prepared by:			
<b>h.</b> Date next review due (Must not exceed one year from date of previous assessment)  <b>(Note: Date might be sooner if circumstances change and assessment therefore no longer valid)</b>							

*The data provided will be used for the purpose of provision of education, training and instruction, administration, marketing and promotion, health, safety and welfare, recruitment, security and prevention and detection of crime. Personal data is collected and processed in accordance with the Data Protection Act 1998*

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| <p>1. <b>Operations covered by this assessment:</b> "Going for a Song" Monitoring of bird sound in two diverse areas:</p> <ul style="list-style-type: none"><li>i. a busy urban road (state location)</li><li>ii. a country lane</li></ul> |
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<b>2. Details of any person(s) specifically at risk:</b>		
<ul style="list-style-type: none"> <li>• Students</li> <li>• Staff</li> <li>• Members of the general public</li> </ul>		
<b>3. Hazards</b>	<b>4. Nature of risks</b>	<b>5. Existing control measures</b>
<b>Urban Road:</b>  1. Road traffic	<ul style="list-style-type: none"> <li>• Trips and fall</li> <li>• RTA</li> <li>• Collision</li> <li>• Broken bones</li> <li>• Fatality</li> </ul>	Activity (by college students) arranged with teaching staff.  Using a 'Smart phone' to record bird sounds, on a busy urban road, was investigated at peak times of the day.  The recordings to take place at the road side away from the kerb
2. Lack of concentration	<ul style="list-style-type: none"> <li>• RTA</li> <li>• collision</li> </ul>	Area to be investigated away from the kerb
3. Inappropriate behaviour: Driver perception /provocation	<ul style="list-style-type: none"> <li>• Annoyance of road users</li> <li>• Distraction of road users</li> </ul>	Telephones directed away from motorists / road users  If asked, students to explain actions /

		report to college staff
<b>Country Lane:</b>  4. Unfamiliar location	<ul style="list-style-type: none"> <li>• Disorientated</li> <li>• Lost</li> <li>• Trips, fall</li> </ul>	Students to inform staff (parents if out of college / weekend) of location and expected return time.
5. Unsupervised activity	<ul style="list-style-type: none"> <li>• Inappropriate behaviour</li> <li>• Trips, fall</li> </ul>	Work carried out in pairs or larger group.  Students are capable, knowledgeable and responsible members of college.
6. Inappropriate behaviour: Perception of people at the location	<ul style="list-style-type: none"> <li>• Irritation / Aggravation</li> </ul>	As above (5)  Smart phone used to record birds sound away from activity (people: walkers / runners) at location



		If asked, students to explain actions / report to college staff
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<b>1. Risk rating factor (based on existing controls)</b> (See calculation guidance below) (Either by individual hazard/risk or overall rating, whichever deemed appropriate to circumstances)			
<b>(A) Severity</b>	<b>(B) Probability</b>	<b>(C) Risk Rating (= A x B)</b>	<b>Action Priority</b>
1) 5	<b>2</b>	<b>10</b>	Low priority in all instances
2) 5	<b>2</b>	<b>10</b>	
3) 3	<b>3</b>	<b>9</b>	
4) 3	<b>2</b>	<b>6</b>	
5) 3	<b>2</b>	<b>6</b>	
6) 3	<b>3</b>	<b>9</b>	

<b>2. Activities identified as requiring more specific assessments: N/A</b>	
<b>3. Has a Further Control Measures Action Plan been prepared in relation to this Risk Assessment?</b>	<b>Yes / No</b>

<b>NOTES: Calculation of risk rating</b>		
<b>A: Severity of incident</b>	<b>B: Probability of occurrence</b>	<b>Determining action priority</b>
Insignificant 1	Very unlikely 1	1 – 10 Low priority (Action if reasonably practicable; otherwise, acceptable)
Minor 2	Unlikely 2	11 – 15 Medium priority (Must take action)
Significant 3	Possible 3	16 – 25 High priority (Must take action)
Major 4	Likely 4	
Fatality 5	Very likely 5	

<b>SIGNATURES</b>		
<b>Prepared by: Signature</b> .....	<b>Print name:</b> .....	
<b>Position:</b> .....	<b>Date:</b> .....	
<b>Reviewed &amp; authorised by line manager: Signature</b> .....	<b>Name</b> .....	<b>Date</b> .....
<i>Note: The line manager is accountable for the risk assessment and is responsible for monitoring any related action plan. He/she</i>		

***must inform the Health & Safety Manager when the action plan has been completed***

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*For Health and Safety Team use only*

*Reviewed by Health and Safety Manager (for completeness, not technical knowledge): .....*