

SCERT UTTARAKHAND — STATE LEVEL TEACHER–STUDENT INNOVATION HACKATHON 3.0

Supporting Script / Resource Document

A. Expert Details

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Area of Expertise	GIS-based mapping tools, EdTech / AI-enabled web applications, school infrastructure & safety data collection

B. Resource Details

Title	“Know Your School” - A Free GIS & AI-Enabled School Mapping and Safety Assessment Tool
Technology / Tool	Browser-based web app (HTML5, JavaScript) built on Leaflet.js, OpenStreetMap, OSRM open routing, and jsPDF; optional Google Maps mode
Target Users	School students (upper-primary to secondary), guided by a teacher, for a one-period “map my school” classroom activity
Duration	Tutorial video: 8–10 minutes. Classroom activity: usable within a single 40–45 minute period
Learning Objective	Students learn to use free, open GIS tools to independently map their school’s exact location, the route from home to school, on-campus infrastructure, and surrounding hazards — and turn that into a structured digital dataset
Outcome	Each student produces a downloadable PDF report (map with route, indicator tables, auto-written conclusion, evidence photos) and a CSV dataset of their school, ready to hand to a teacher or block/district education office

C. Problem Statement

Many schools — especially in hilly and rural regions such as Uttarakhand — have no digitised record of their exact location, the safest route students take from home, the physical condition of their infrastructure, or the hazards in their surroundings (landslide-prone slopes, rivers, unguarded roads). This information is essential for disaster preparedness planning, safe-school audits, and route-safety decisions, yet it is rarely collected systematically, and almost never by the students themselves. Existing GIS tools (QGIS, ArcGIS, Google My Maps) either require installation, training, or a paid account, putting them out of reach for a typical school student with only a shared classroom computer or a personal phone. There is no free, zero-setup way for a student to pin their

school and home, capture the route and its hazards, record structured infrastructure indicators, and generate a professional report a school or education authority can actually use.

D. Proposed Solution

“Know Your School” is a single, free, browser-based web application — no installation, no account, no cost — that lets any student map their school in one sitting. It uses free OpenStreetMap data (with an optional Google Maps mode for students who already have their own free-tier API key) to: pin the School and Home locations; auto-fetch the road route and travel time, or let the student hand-trace their actual walking path; load nearby facilities and mark hazards, including a free-form pin tool for any other school-based or surrounding-based indicator the student observes; fill a structured “School Profile” covering infrastructure, ICT resources, human resources, connectivity, and disaster preparedness; and attach categorised evidence photos, with an optional on-device AI check of infrastructure condition from those photos. One click then generates a polished PDF report — including a real map snapshot (or a guaranteed self-drawn route diagram if a live snapshot isn’t possible), compact indicator tables, and an auto-written conclusion — plus a raw CSV dataset.

E. Tools Required

Software / platform:

- Any modern web browser — Chrome, Firefox, or Edge (desktop, Chromebook, or smartphone)

Libraries used (all free and open-source, loaded automatically):

- Leaflet.js — interactive mapping
- OpenStreetMap tile data & Nominatim — free basemap and place search
- OSRM — free, open road-routing engine
- jsPDF + jsPDF-AutoTable — in-browser PDF report generation
- html2canvas — map-snapshot capture for the report

Hardware / connectivity:

- Any laptop or smartphone with a browser; a GPS-enabled phone improves “use my location” accuracy
- Internet access is needed for maps, search, and routing; the PDF report still generates offline via the built-in vector route-diagram fallback

Free / open alternative note: every default tool in this resource is free and open-source; an optional Google Maps mode is offered only for students who choose to supply their own free-tier key — it is never required.

F. Step-by-Step Demonstration

- Open the tool directly in a browser — no installation or sign-in required
- Search for, or use “my location” to pin, the School on the map
- Pin the Home location the same way
- View the auto-calculated straight-line distance; fetch the road route (distance & travel time), or trace the actual walking path point-by-point
- Load nearby facilities automatically, mark hazards, and drop custom pins for any other school-based or surrounding-based indicator
- Complete the School Profile form — infrastructure, ICT, human resources, connectivity, preparedness
- Upload evidence photos by indicator category (optional AI condition check on photos)
- Click “Download PDF” — show the generated map, the indicator tables, and the auto-written conclusion
- Click “Download CSV” to export the raw dataset

G. Expected Output

A downloadable PDF report containing a map with the school–home route and any indicator pins, two compact indicator tables (School-Based and Surrounding-Based), an auto-generated conclusion, and the student’s evidence photos — plus a companion CSV file with the raw data. Both are ready to submit to a teacher, school head, or block/district education office.

H. Innovation Extension

- Aggregate submissions from every school in a cluster or district into a shared dashboard for regional infrastructure and hazard mapping
- Extend the AI photo-check to automatically flag specific defects (cracks, broken furniture, blocked exits) using a vision model
- Add Hindi / regional-language support and link to UDISE+ so official school records auto-fill part of the profile

I. References

- OpenStreetMap contributors — openstreetmap.org/copyright (map & place-search data, Open Database Licence)
- Leaflet.js — leafletjs.com (BSD-2-Clause licence)
- OSRM Project — project-osrm.org (open routing engine, BSD licence)
- jsPDF & jsPDF-AutoTable — github.com/parallax/jsPDF (MIT licence)
- html2canvas — html2canvas.hertzen.com (MIT licence)
- Esri World Imagery — optional satellite basemap layer, used under Esri’s free-tier terms of use

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