lumos
CONTROLS
A WiSILICA BRAND

Lighting Controls Design Guide
SCHOOL

The U.S Department of energy reports that K-12 schools spend more than $8 billion annually on energy, making energy the second-highest operating expenditure for schools after personnel costs. annually on energy, with lighting accounting for 50%. Implementing lighting control strategies is an effective way to reduce energy, save money, reduce maintenance and improve learning experience.

Lumos Controls has been assisting building communities create spaces as they wish- energy-efficient and lively. We thought that sharing our experiences and best practices will be helpful for your next projects.

This guide will brief you on how we design lighting control strategies for a school with a focus on:

→ Improving energy-savings
→ Improving task tuning and visual comfort
→ Ease of maintenance
→ Simplifying reconfiguration and upgrades

# School Buildings Possibilities
With Us- Save Energy
and Improve Learning Experiences

We have a device portfolio that is simple to install and easy-to-use.

Energy efficiency and comfort are crucial in lighting, and our lighting controls help you achieve them. Our future-proof solution helps you save energy, enhance the ambiance, and guarantee better learning experience through easy deployment of lighting control strategies. We also provide detailed analytical reports on energy utilization, occupancy patterns, and device usage. You will maximize ROI with better energy savings. The solution easily integrates with the building management system, bringing added benefits.

Did you know??

The sleep-wake cycle of kids and staff may be disturbed if your school adopts a lighting system that doesn't correspond with our natural circadian rhythm. This can lead to more absences and lethargies because it may impair one's ability to concentrate.

Awakening
Nucleus raphes
Serotonin

Melatonin
Pineal gland
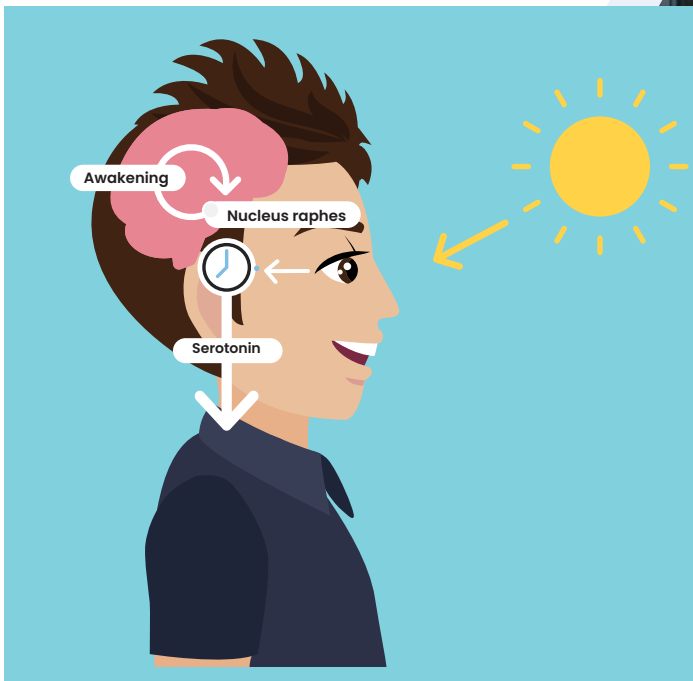
Lighting Control Strategies
for Each Spaces

| Control Requirement	Code Summary	Classroom	Open Plan Office	Libraries	Stairwell	Sports Hall
Manual ON/OFF/Dimming	Areas with occupant sensors shall incorporate a manual control to allow occupants to turn fixtures off (IECC)	Yes	Yes	Yes	Yes	Yes
Time Scheduling	Lighting not already shut off by Automatic Full Off control must be shut off when scheduled unoccupied (Ashrea)			Yes		Yes
Occupancy Control	Occupancy sensor control devices shall be installed to automatically turn lights off within 20 minutes of all occupants leaving the space (IECC)	Yes	Yes	Yes	Yes	
Vacancy Control	The vacancy sensor must provide the occupant with the option to turn the lights off manually. (Title 24)	Yes	Yes	Yes	Yes	
Daylight Harvesting	Daylight-responsive controls shall be provided. (IECC)	Yes	Yes	Yes	Yes	Yes
Emergency Lighting		Yes	Yes	Yes	Yes	Yes

Did you Know?

Higher color temperatures (4,600K or more) appear blue-white and are called cool or daylight colors.

Mid-range color temperatures (3,100K–4,600K) appear cool white.

Lower color temperatures (up to 3,000K) range from red to yellowish-white in tone and are called warm colors.

Classroom
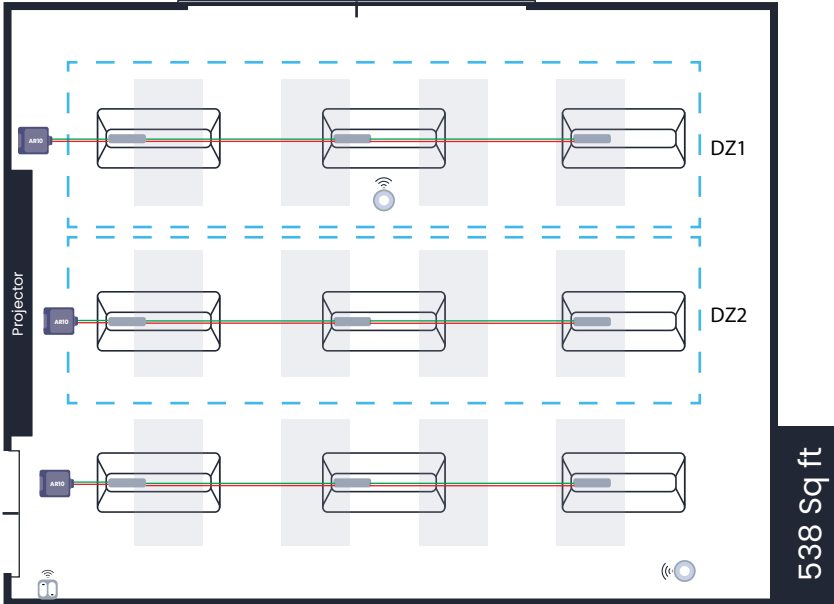
DZ1

DZ2

Projector

538 Sq ft

147.6ft is the device-to-device BLE communication distance with LoS. The actual range depends on the installation conditions and varies between 30ft - 130ft.

◯ Motion/Light Sensor   [AR10] 0-10 Room Controller   [ ] Switch   DZ : Daylight zone

Many activities like reading, writing, presentations, and extracurriculars happen in the classroom. This space demands strategies to enhance occupants' ability to concentrate, and ensure visual comfort while learning.
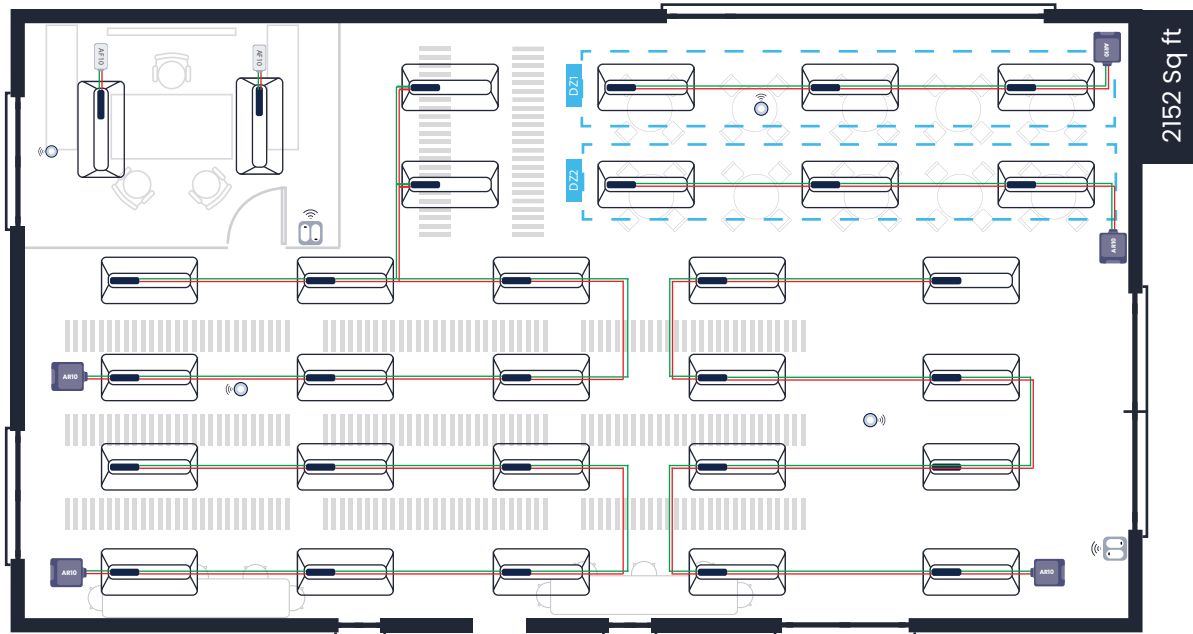
We suggest

→ Task tuning for alertness, visual comfort, and energy savings
→ Occupancy/Vacancy sensing for safety and energy savings
→ Daylight sensing to improve energy savings, concentration and productivity

Pro tip:

You can use controllers to implement high-end trim for maximizing energy savings and visual comfort. Occupancy sensors and controllers work together to detect human presence to turn lights ON automatically. Controllers and vacancy sensors detect vacancy and turn OFF devices. If the room gets enough daylight, incorporate light sensors and controllers for open-loop daylight harvesting. On the contrary, if you want to set a required light level, use light sensors and controllers for closed-loop daylight harvesting.

Libraries

2152 Sq ft

147.6ft is the device-to-device BLE communication distance with LoS. The actual range depends on the installation conditions and varies between 30ft - 130ft.
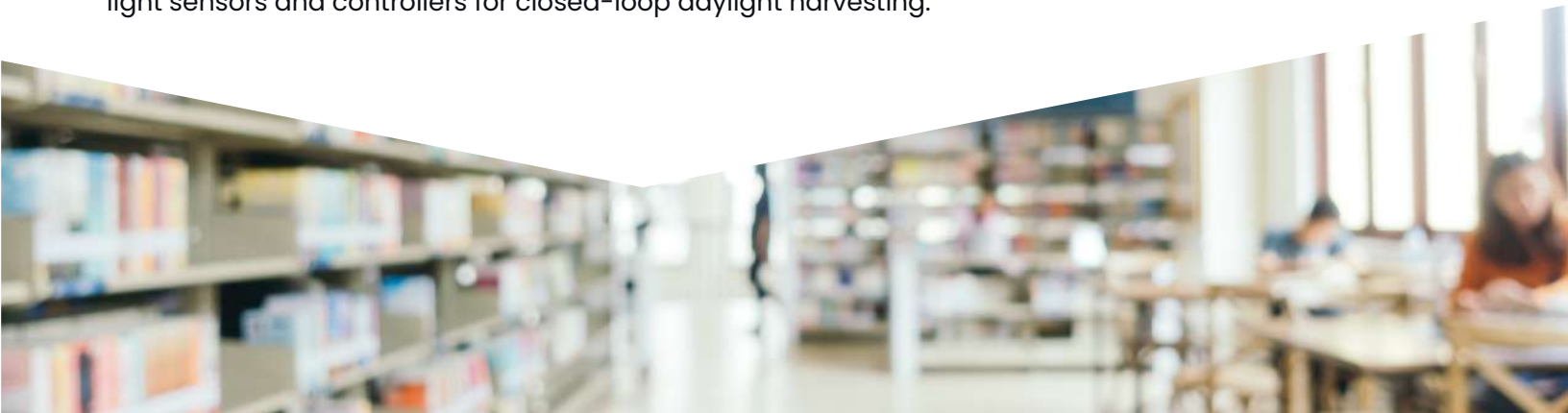
○ Motion/ Light Sensor | AF10 0-10V Fixture Controller | AR10 0-10V Room Controller | ▯▯ Switch | DZ : Daylight zone

Libraries should have a warm and inviting ambiance that helps students to concentrate better. It is possible to achieve comfort and energy savings with appropriate light intensity. Natural light will also help conserve energy and create a comfortable study atmosphere.

We suggest

→ Task tuning for alertness, visual comfort, and energy savings
→ Time Scheduling for conveneince and energy savings
→ Occupancy sensing for safety and energy savings
→ Daylight sensing to improve energy savings, concentration and productivity

Pro tip:

You can implement task tuning using our controllers and create glare-free lighting. Also automates luminaire functions at pre-set time-slots of the day, week, or month. Occupancy sensors and controllers work together to detect human presence to turn lights ON automatically. Controllers and vacancy sensors detect vacancy and turn OFF devices. If the room gets enough daylight, incorporate light sensors and controllers for open-loop daylight harvesting. On the contrary, if you want to set a required light level, use light sensors and controllers for closed-loop daylight harvesting.

Open-plan Offices
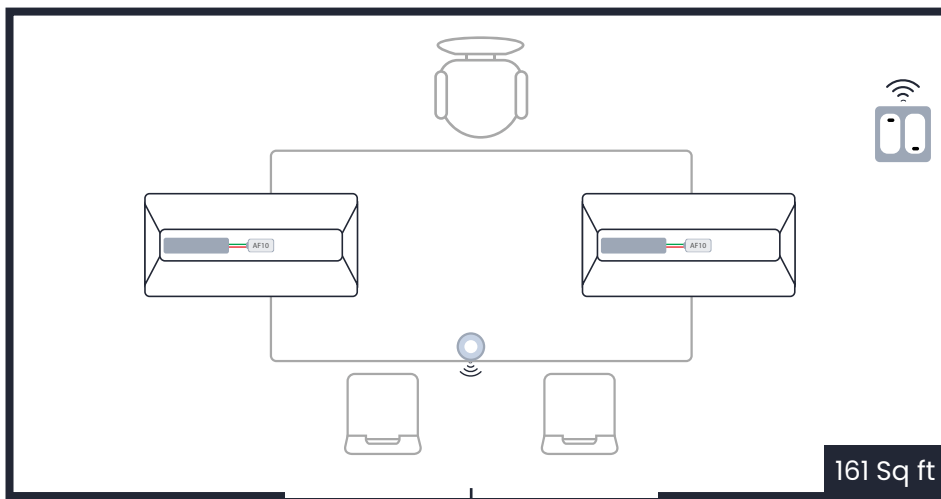
161 Sq ft

147.6ft is the device-to-device BLE communication distance with LoS. The actual range depends on the installation conditions and varies between 30ft - 130ft.

◯ Motion/Light Sensor   AF10 0-10V Fixture Controller   ▯▯ Switch

An open-plan office will have long rows of desks with little or nothing dividing them. It will have circulation areas, lounges with couches or play areas with plenty of seating. Long rows of desks need cool lighting to keep students active, and the circulation or relaxing spaces need warm lighting.
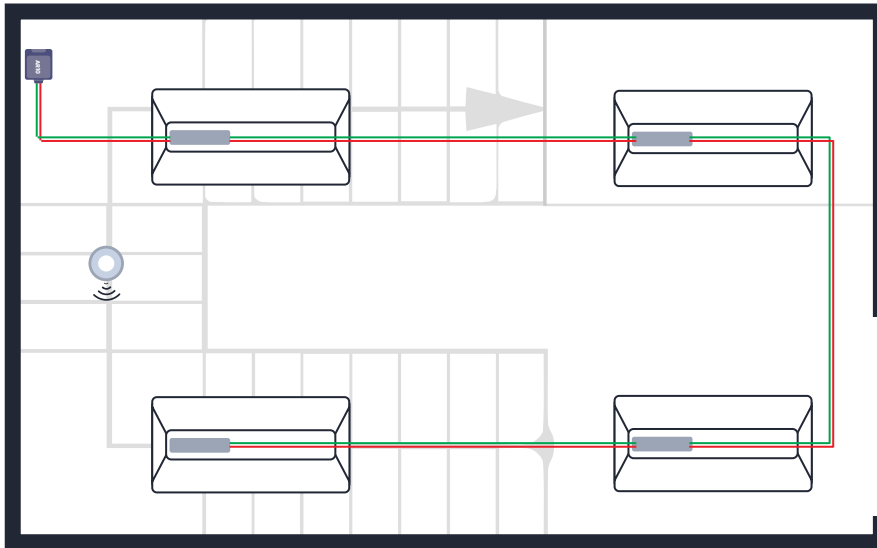
We suggest

→ Task tuning for alertness, and visual comfort
→ Occupancy/Vacancy sensing for safety and energy savings
→ Daylight sensing to improve concentration, productivity and enhanced energy savings

Pro tip:

Use controllers to set required light level for tasks. Occupancy sensors and controllers work together to detect human presence to turn lights ON automatically. If the room gets enough daylight, incorporate light sensors and controllers for open-loop sensing. On the contrary, if you want to set a required light level, use light sensors and controllers for closed-loop sensing.

Stairwells

147.6ft is the device-to-device BLE communication distance with LoS. The actual range depends on the installation conditions and varies between 30ft - 130ft.

⊙ Motion/Light Sensor   [AR10] 0-10V Room Controller   ▯ Switch

Stairwells require adequate brightness levels for efficient navigation and ensure safety. Utilizing motion and daylight sensors are effective ways to reduce energy consumption.

We suggest

→ Occupancy/Vacancy sensing for safety and energy savings
→ Daylight sensing to improve concentration, productivity and enhanced energy savings

Pro tips:

Implement occupancy sensors and controllers together to detect human presence to turn lights ON automatically. Controllers and vacancy sensors detect vacancy and turn OFF devices. If the room gets enough daylight, incorporate light sensors and controllers for open-loop sensing. On the contrary, if you want to set a required light level, use light sensors and controllers for closed-loop sensing.

Sports Hall

10763 Sq ft
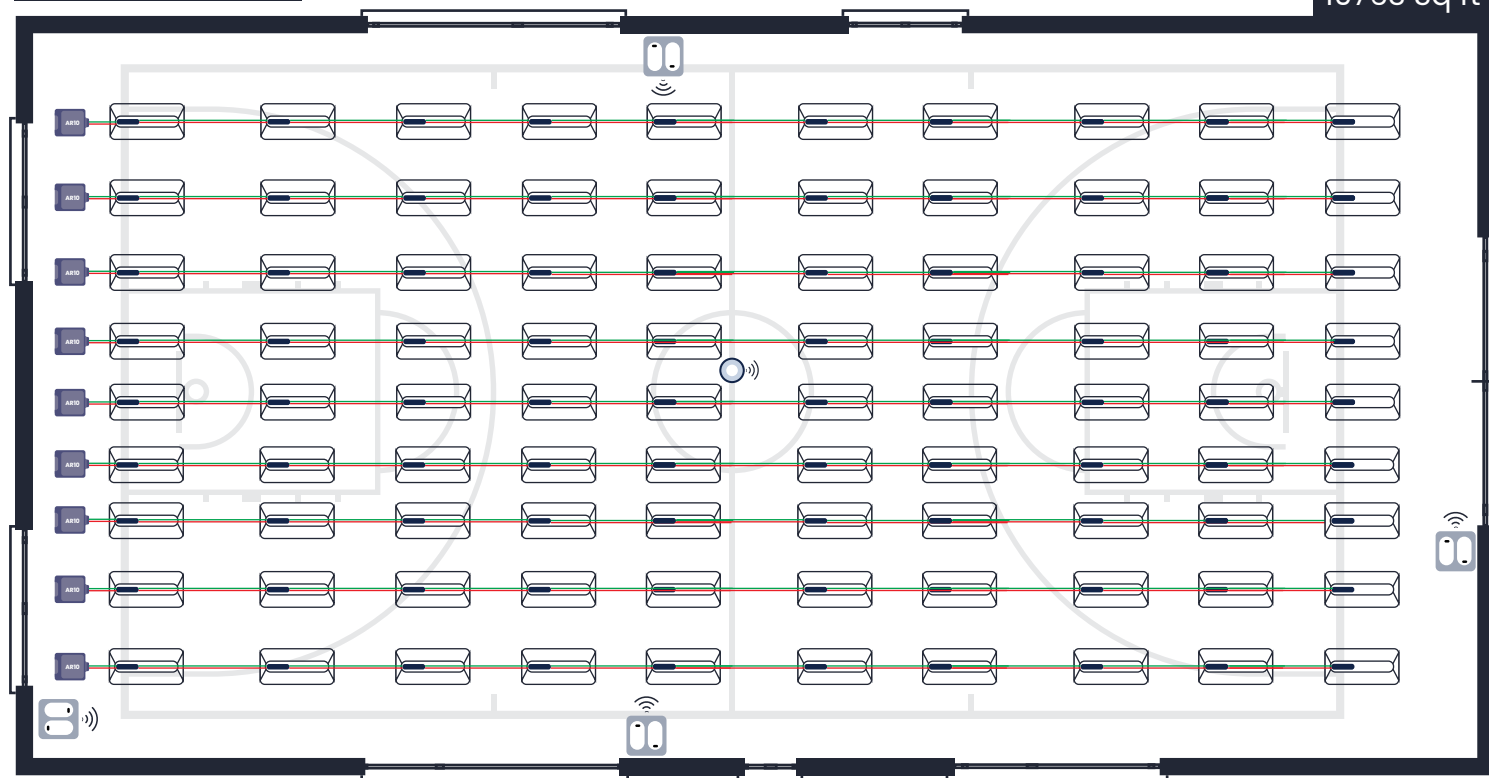
147.6ft is the device-to-device BLE communication distance with LoS. The actual range depends on the installation conditions and varies between 30ft - 130ft.

○ Motion/ Light Sensor   AF10 0-10V Fixture Controller   AR10 0-10V Room Controller   Switch

The secret to adequate sports hall lighting is uniform illumination that meets the lighting requirement.

We suggest

→ Daylight sensing enhance productivity and energy savings
→ Time Scheduling for convenience and energy savings

Pro tips:

If the room gets enough daylight, incorporate light sensors and controllers for open-loop sensing. Also automates luminaire functions at pre-set time-slots of the day, week, or month. If you want to set a required light level, use light sensors and controllers for closed-loop sensing. It will further contribute to minimising energy consumption, which can generate major costs if bright sports hall lighting is used excessively.

Use our mobile app to enjoy maximum convenience and flexibility. You can wall mount our kinetic/ remote switches for ease of use. Our controllers meet emergency lighting requirements to ensure your building safety. Implement plug load controls for maximizing energy savings.

Grow Seamless

Optimize building operations with our advanced reports and analytics.

→ Understand occupancy patterns
→ Energy utilization
→ Device usage

Emergency monitoring dashboards ensure occupant safety 24*7

[Available only with our DALI lighting control system]

Device Placement Guidelines

Device placement considerations are crucial for optimizing the performance and functionality of devices in various scenarios. Here are some key points to consider:

1. **Signal Strength and Distance:** Keep in mind that signal strength tends to weaken as the distance between devices increases. Therefore, it is essential to consider the proximity of devices to ensure reliable communication. Maintain an appropriate distance between devices to ensure optimal signal strength.

2. **Metal Structures:** When devices are placed near metal structures, it is important to ensure that the Bluetooth Low Energy (BLE) antennas have a clear line of sight with nearby devices. This can be achieved by creating small holes in the metal enclosure to allow the BLE antennas to maintain connectivity.

3. **Sensor Mounting Guidelines:** Install sensors in a way that protects them from damage, vandalism, and accidents. Avoid placing sensors near heating sources that can cause rapid temperature changes within the detection or measurement zone. This includes air vents, fan heaters, incandescent lamps, and halogen lamps.

4. **Interference-Free Detection Range:** Ensure that the detection range of sensors is free from interferences that can affect their performance. Identify and mitigate potential sources of interference to maintain accurate and reliable measurements.

5. **Light Sensor Placement:** When using light sensors, make sure they only measure indirect light (light reflected from other surfaces) to avoid measurement distortions caused by direct sunlight. This ensures accurate and consistent measurement results.

6. **Scaling Up for Large Installations:** For large installations, establish a proper building hierarchy before commissioning the devices. Use Lumos Controls app, which allows devices to be divided among Buildings, Floors, and Zones. Choose the appropriate Zone for each device during commissioning. Note that devices commissioned in a Zone can only communicate with other devices in the same Zone. It is recommended to use a single phone for commissioning and configuring devices within a specific Zone to avoid multiple sync attempts to the cloud.

7. **Proximity for Configuration:** When creating, deleting, or editing Groups, Scenes, Schedules, etc., ensure that you are within the Bluetooth Low Energy (BLE) range of the related control devices. This proximity is necessary for seamless configuration and synchronization.

By considering these device placement considerations, you can optimize the performance, reliability, and functionality of your devices in various environments and scenarios.

We have a wide range of products that can help you create energy-efficient and future-proof school buildings in just a few clicks.

Know it here

lumos
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