

# SYSTEM REQUIREMENTS

Version 5.0

Waterford  
Early  
Learning™

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## Overview

Based on current hardware and software technologies, Waterford Institute has determined that the system requirements listed in this document will deliver acceptable operation and performance for *Waterford Early Learning™ 5*.

Your site's actual performance may vary due to different configurations, including the following:

- Server application load
- Client security configuration
- Courseware usage
- Available network bandwidth
- Number of concurrent users
- Other variables

System requirements are subject to change because of rapid advances and changes in technology, as well as future product enhancements. If you have questions regarding the suitability of your specific computing environment, contact your Sales Representative or Sales Engineer.

These specifications are intended strictly as a guideline. They were developed in an environment free from network congestion, resource contention, and aggressive security measures.

Consider the minimum requirements applicable only if your workstations use a minimally configured and supported operating system, a minimally configured virus scanner, and only *Waterford Early Learning*.

**All Microsoft service packs and security patches should be installed. Waterford Institute recommends the latest version of all programs, unless noted otherwise.**

## Client Workstation

	Windows®	Mac®
<b>Operating System</b>	Windows® XP Professional Windows Vista™ Business Windows® 7 Professional 32-bit or 64-bit for all systems	Mac OS® X 10.6 (Snow Leopard) 32-bit or 64-bit
<b>Processor</b>	Intel® Pentium® 4 1.6 GHz or higher	Intel® Mac 1.8 GHz or higher
<b>RAM</b>	1 GB 2 GB on Windows Vista™ Business or Windows® 7 Professional	2 GB
<b>Disk Space</b>	5 GB available	5 GB available
<b>Network Interface</b>	One 100 Mbps	One 100 Mbps
<b>Software</b>	Flash® 10.3.181.14 or higher in Internet Explorer® Java® 6 Update 18 or higher	Flash® 10.3.181.14 or higher in Safari® Java® 6 Update 18 or higher
<b>Peripherals</b>	Sturdy headset with microphone Numeric 10-key pad (recommended for math curriculum)	Sturdy headset with microphone Numeric 10-key pad (recommended for math curriculum)
<b>Internet Browser</b>	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9	Firefox® 4 Google Chrome™ 11 Safari® 5

## Single Server Deployment

The Waterford server is made up of three components: application server, database, and media server. The single server deployment is a model in which all components of the software are installed on one physical server.

Typically, the single server is located in a lab or other school location used by the lab or individual school. The single server can be available to multiple schools if all requirements are met, including network interface and concurrent student limitation.

	Up to 10 Concurrent Students	Up to 50 Concurrent Students	Up to 150 Concurrent Students
<b>Operating System</b>	Windows® XP Professional Windows Vista™ Business Windows® 7 Professional 32-bit or 64-bit for all systems	Windows Server® 2003 R2 Windows Server® 2008 Windows Server® 2008 R2 32-bit or 64-bit for all systems	Windows Server® 2008 R2 64-bit only
<b>Processor</b>	Intel® Core™ 2 Duo 2.13 GHz	Intel® Xeon® 2.4 GHz dual core	Up to 75 concurrent students: one Intel® Xeon® 2.4 GHz quad core processor or two Intel® Xeon® 2.4 GHz dual core processors  Up to 150 concurrent students: two Intel® Xeon® 2.4 GHz quad core processors
<b>RAM</b>	4 GB	4 GB	6 GB
<b>Disk Space</b>	100 GB available	100 GB available	100 GB available
<b>Hard Drive or Disk Performance</b>	7.2K RPM SATA or better	Four 15K RPM SAS drives in RAID 10	Four 15K RPM SAS drives in RAID 10
<b>Network Interface</b>	Gigabit or better	Gigabit or better	Gigabit or better
<b>Network</b>	Gigabit or better to the switch	Gigabit or better to the switch	Gigabit or better to the switch
<b>Internet Access</b>	Yes—for authentication and online help only	Yes—for authentication and online help only	Yes—for authentication and online help only
<b>Internet Browser</b>	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9

## Multiple Server Deployment

The Waterford server is made up of three components: application server, database, and media server. The multiple server deployment is a model in which the media is distributed onto separate hardware in order to allow for 1) bandwidth constraints between sites or 2) scale of implementation. The application server and database server continue to be installed on one physical server.

Typically, the servers are located in a district office or data center used by the entire district or multiple schools. Media servers can be moved on site to address bandwidth constraints and offset the media from transversing the WAN.

Multi-server installations vary by customer. A Sales Engineer should be involved early in order to discuss bandwidth requirements in a multi-server distributed WAN environment and to determine the best configuration to achieve desired performance and optimal end-user experience.

## Media Only Up to 150 Concurrent Students

	Up to 50 Concurrent Students*	Up to 75 Concurrent Students*	Up to 150 Concurrent Students*
<b>Operating System</b>	Windows Server® 2003 R2 Windows Server® 2008 Windows Server® 2008 R2 32-bit or 64-bit for all systems	Windows Server® 2008 R2 64-bit only	Windows Server® 2008 R2 64-bit only
<b>Processor</b>	One Intel® Xeon® 2.4 GHz dual core processor	One Intel® Xeon® 2.4 GHz quad core processor or two Intel® Xeon® 2.4 GHz dual core processors	Two Intel® Xeon® 2.4 GHz quad core processors
<b>RAM</b>	4 GB	6 GB	6GB
<b>Disk Space</b>	50 GB available	50 GB available	50 GB available
<b>Hard Drive or Disk Performance</b>	Two 15K RPM SAS drives in RAID 1	Two 15K RPM SAS drives in RAID 1	Two 15K RPM SAS drives in RAID 1
<b>Network Interface</b>	Gigabit or better	Gigabit or better	Gigabit or better
<b>Network</b>	Gigabit or better to the switch	Gigabit or better to the switch	Gigabit or better to the switch
<b>Internet Access</b>	No Internet access required	No Internet access required	No Internet access required
<b>Internet Browser</b>	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9

\*One server per 50-150 concurrent students depending on RAM, CPU, and operating system

## Application and Database Only up to 1000 Concurrent Students

	Up to 200 Concurrent Students**	Up to 400 Concurrent Students**	Up to 1000 Concurrent Students**
<b>Operating System</b>	Windows Server® 2008 R2 64-bit only	Windows Server® 2008 R2 64-bit only	Windows Server® 2008 R2 64-bit only
<b>Processor</b>	One Intel® Xeon® 2.4 GHz dual core processor	One Intel® Xeon® 2.4 GHz quad core processor	Two Intel® Xeon® 2.4 GHz quad core processors
<b>RAM</b>	8 GB	16 GB	16 GB
<b>Disk Space</b>	30 GB available	30 GB available	30 GB available
<b>Hard Drive or Disk Performance</b>	Four 15K RPM SAS drives in RAID 10	Four 15K RPM SAS drives in RAID 10	Four 15K RPM SAS drives in RAID 10
<b>Network Interface</b>	Gigabit or better	Gigabit or better	Gigabit or better
<b>Network</b>	Gigabit or better to the switch	Gigabit or better to the switch	Gigabit or better to the switch
<b>Internet Access</b>	Yes—for authentication and online help only	Yes—for authentication and online help only	Yes—for authentication and online help only
<b>Internet Browser</b>	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9	Firefox® 4 Google Chrome™ 11 Internet Explorer® 8 or 9

\*\*One server per 200 - 1000 concurrent students depending upon RAM and CPU.

# Firewall Settings

For server-to-server communication in a multi-server environment

	Port	Inbound	Outbound
Media + Application	80	No	Yes—once for authentication
	8080	Yes—to let clients access the application	No
	8081	Yes—to let clients access reports	No
Database	5432	Yes—to let the application server access the database server	No
Client Application	5555 5556 These ports must be unused on each client station to run Mouse and More.	N/A	N/A

## Bandwidth Considerations

The available bandwidth between the site and central data center will impact on the end users' experience. In some cases, media servers will be required at the site level to offset the media from traversing the WAN. Contact your Sales Engineer about all bandwidth considerations.